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ABSTRACT

The purpose of the study was to explore the effect on parents and children of training parents in the use of the precision teaching approach to behavior modification in an effort to increase their ability to manage retarded children at home. During a 10-week training period, parents learned the modification procedure evolved by Ogden Lindsley and were successful in managing behavior. Of the 20 families who attended the first group meeting, only six attended more than two sessions although 10 others offered what were considered to be good reasons for discontinuance. Individual case studies are cited which reveal the immediacy of the changes in most instances, and tables and graphs report this information. Projects that were only marginally significant or not amenable to statistical evaluation are also included. Conclusions were that parents can be trained in precise behavioral management and can become independent and creative in its use. Recommendations concern reduction of attrition rate, simplified rate data forms, and use of a specific text. (RJ)

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PARENT TRAINING IN PRECISE BEHAVIOR MANAGEMENT
WITH MENTALLY RETARDED CHILDREN

Devoe C. Rickert, Ed.D.
Dept. of Special Education
Utah State University
Logan, Utah 84321

James G. Morrey, Ed.D.
Dept. of Counselor Education
and Special Education
Idaho State University
Pocatello, Idaho 83201

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Devoe C. Rickert, Ed.D.

James G. Morrey, Ed.D.

Utah State University

Logan, Utah

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The research reported herein was performed pursuant to a contract with the Bureau of Education for the Handicapped, U.S. Office of Education, Department of Health, Education, and Welfare. Contractors undertaking such projects under government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official position of the Bureau of Education for the Handicapped.

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PROBLEM

Much of the research that has been done regarding parent-child relations in families with handicapped children has been concerned with the effects of various parental factors on the personality and adjustment of the child. In the main, these have been studies of the child-rearing practices and the attitudes and personalities of the parents as they affect the child (Medinnus, 1965; Milton, 1958). Studies of counseling and therapy techniques have been reported, but little has been published regarding behavior management with handicapped children.

The comparative recency of research activity in the area of mental retardation may be one of the reasons why some aspects of behavior (i.e., the parents' ability to manage behavior) remain largely unresearched. Ellis (1966), for example, does not cite a single reference dealing with parent training or with parents' child-management abilities. Another reason may be simple expediency. Research is more commonly undertaken with the child than with the parents because it is more difficult to secure parental cooperation and interest. A possible deterrent to studies concerned with parent training in behavior management is that there are many problems encountered when setting up acceptable learning programs which the parents can understand and employ regularly in their relationships with their children.

In spite of the fact that little has been done, many writers (Sarason, 1953; Michaels and Schucman, 1962; Cummings and Stock, 1962, for example) feel that the needs and abilities of parents should be considered and studied both in their own right and in terms of their impact on children. Attempts to study parental needs and to help parents adjust to the situation of having a handicapped child in the home have been done primarily by using either a therapy approach or an information-giving approach (Green and Durocher, 1965; Bitter, 1964; Peterson, 1967). Cummings and Stock (1962) state that therapy with mothers of retarded children " . . . hopefully . . . can lead to an increase in the adequacy and consistency of their own training measures with the child and the decisions which they make regarding the use of schools and institutions." There is little evidence that this result obtains from therapy, however (Bitter, 1964; Levitt, 1963).

Any attempt at studying parent-child relationships should take into account that the behavior and needs of the parents are as important to understand as the behavior of the handicapped child. This problem has been underscored by the findings of Eyman, Dingman, and Sabagh (1966), which suggested that the crucial factors in decisions to institutionalize a retarded child were more related to the needs, attitudes, and education of the parents than to the retardates' handicaps or behavior problems.

Since traditional information-providing and therapy approaches have accomplished little in the way of demonstrating improvements in either the attitudes or the abilities of parents to manage the behavior of the handicapped child, there remains a need to discover effective ways of achieving this improvement. The problem is that there is a lack of knowledge as to the effects on parents and children of improvements in parents' behavior management abilities. The current research will attempt to answer the question: Can the parents of retarded children be trained to become more efficient managers of their child's behavior when involved and instructed in a behavior modification system relying on rate data and charted behavioral observation?

The effectiveness of behavior modification programs managed by teachers (Vaughan, 1968) suggests that this approach might be used quite effectively by parents. While behavior modification has on occasion been explained to some parent groups, there is little recorded evidence of the effects on parents and children of a systematic attempt to train parents to use it in managing behavior of retarded children at home.

Related Research

Until recently, the emphasis of research on parent-child relationships has been on assessing the effect of parental attitudes and child-rearing practices on the behavior or adaptation of the handicapped child. An explanation of the concern of researchers with the child and his problems, rather than with those of the parent, has been advanced by Ross (1964), who contends that the majority of professional people with whom parents come into contact are primarily involved with the child (e.g., pediatricians, neurologists, psychologists, and educators). Hence, most researchers are interested in the parents' attitudes and feelings only inasmuch as they affect the child and his development.

While studying the ways in which parents and siblings explained brain-damaged children in the family, Barsch (1961) found that whatever the explanations of the parents were, those of the siblings tended to be quite similar, suggesting that the siblings of the mentally retarded child imitate their parents' attitudes toward him.

If the self-image of the retarded child is derived from the attitudes and behaviors of those around him, the environment in which he grows up can create many emotional complications for him. Environmental differences are illustrated by these studies. Zunich (1962) found that maternal attitudes toward children were significantly related to the mothers' behaviors in interaction with their children. Worchel and Worchel (1961) strongly recommended that efforts be made toward developing better parental attitudes. Their study was based on parental ratings of their retarded child, the "average" child, and their concept of the "ideal" child. Using the disparity between ratings as an index to the amount of rejection, they concluded that there is greater parental rejection of the retarded child than of the normal child.

As already noted, Eyman, Dingman, and Sabagh (1966) have made the observation that it may not be the retardate's handicaps or his behavior problems that cause him to be institutionalized so much as the parental perceptions of these and the resultant parental attitudes and practices regarding the behaviors and handicaps of their children.

Several authors (notably Ross, 1964, and Sarason, 1953) have referred to the importance of the family with regard to the development of behavior and the process of learning in the child. Results of several studies concerned with this problem have indicated that parental attitudes and practices do indeed have a tremendous influence on the behaviors and handicaps of their retarded children (Barsch, 1961; Eyman, Dingman, and Sabagh, 1966; Medinnus, 1961). It seems to have been assumed that parents can control and manipulate their own needs and attitudes, as well as their practices. Recently, however, the needs of the parents have begun to be studied in their own right (Ross, 1964). When attention did shift to parents, many investigators "over-shifted," and dealt almost exclusively with the parents. Examples of this include the therapy and/or information-giving approaches to changing parental attitudes or practices (Bitter, 1964; Cummings and Stock, 1962; Michaels and Schucman, 1962). Both approaches rely on the ability of "understanding" to effect these changes. The fallacies of these approaches are aptly pointed out by Bandura in the following assertion.

. . . Grossly deviant behavior in both children and adults . . . can be eliminated, reinstated, and substantially increased depending upon the amount of interest, attention, and solicitous concern such behaviors elicit from others. A positive relationship thus has the potentiality both to help and to harm. The well-intentioned, benign attitudes frequently advocated by many theories of personality may actually foster social reinforcement contingencies that have injurious consequences; this consideration suggests that child-rearing, educational and therapeutic practices must be evaluated by their effects upon recipients rather than by the humanitarian intent of change agents. Many well-meaning people who subscribe to these mental hygiene practices, which have been widely promulgated over the years, may at times inadvertently support or even increase the very problems their earnest efforts are designed to ameliorate. (Bandura, 1969, p. 78)

The President's Panel on Mental Retardation (1969) discussed the desirability of getting and keeping parental involvement in conjunction with training programs for handicapped children. Their recommendation was that parent involvement should be mandatory whenever handicapped children were included in special training programs. The type of involvement was not specified.

Two of the most productive researchers in recent years who have addressed themselves to both parents and children do so on a behavioral basis. One, Gerald Patterson (Patterson, 1965; Patterson, Ray, and

Shaw, (1968) believes in a "total environmental" approach to education. He strives to include the parents in the training of their children, but not explicitly as managers. His approach is to work with the entire family, using social learning theory as a basis for therapy. This approach emphasizes both social reinforcement and environmental change concurrent with problem behavior change. As Patterson (1968) worked with parents (usually parents of extreme problem children), his first requirement was to have them complete his own programmed training manual on social learning theory and environmental intervention. Only upon completion of this program would intensive professional help be offered. It is only since early 1969 that his programmed training manual has become generally available. It is published under the title: *Living with Children*.

Excluding this social learning theory text, Patterson's approach has relied on intervention and suggestions for proceeding with behavior modification which were provided by a trained observer and behavioral psychologist. This may be due to the "extreme problem" nature of the children and families with which he worked. Even so, his estimated intervention costs and the costs associated with behavioral change (1968) were very much less than could be expected through psychotherapy or family counseling.

A second researcher interested in environmental control, especially in managing the behavior of the child, is O. R. Lindsley (1966), who maintains that the people in closest contact with the children can most efficiently manage their behavior. This position does not seek to disparage other professionally-trained people, but rather to supplement and complement their efforts. Psychiatrists, for example, cannot reach as many people as can psychologists. Nurses and social workers have more contact with children; but teachers, by virtue of their much higher ratio to students, are in possibly the best position of professionals to work with behavior problems. Dr. Lindsley points out that parents have the most favorable ratio, due to the fact that there are enough of them to work on a one-to-one or even two-to-one basis with the child. The parents thus comprise the resource group most likely to have a consistent and prolonged effect on the behavior of children.

Authors of recently published books and articles generally agree that the problems of concern to parents, as well as to educators, are those that come from differences in behaviors that distinguish the retarded from other children. The retarded person is visible to the extent of this disparity between behaviors (Bijou, 1968; Barsch, 1961; Burchinal, 1958; Cohen, 1962; Eyman, Dingman, and Sabagh, 1966).

Identification of problem behaviors, and subsequent systematic attempts to change them, has been achieved by many people concerned with behavior modification (Bandura and Walters, 1964; Patterson and Brodsky, 1966; Patterson, Ray, and Shaw, 1968; Azrin and Lindsley, 1956). Very recently, "precision teaching" has evolved as a method of behavior management (Lindsley, 1964, 1966). Precision teaching is a practical, rather than a technical, approach to behavior modification.

It provides for continuous measurement of behavioral change as a function of the manipulation of specific variables in a child's environment (Sulzbacher and Houser, 1968). It employs principles of learning and behavior, but avoids the use of unwieldy terminology and procedures. The precision teaching method provides empirical criteria by reporting specific performance rates. This data permits making judgments about continuing or discontinuing specific tactics when attempting to change behavior. Success or failure of the tactics tried is clearly indicated by changes in the student's behavior as shown by the data.

Bandura points out the inappropriate parental practices that can be avoided or improved upon by some knowledge of behavior modification when he states:

Parents . . . intuitively employ rewards in their attempts to influence and modify behavior, but their efforts often produce limited results because the methods are used improperly, inconsistently, or inefficiently. In many instances considerable rewards are bestowed, but they are not made conditional upon the behavior that change agents wish to promote; long delays often intervene between the occurrence of the desired behavior and its intended consequences; special privileges, activities, and rewards are generally furnished according to fixed time schedules rather than performance requirements; and, in many cases, positive reinforcers are inadvertently made contingent upon the wrong types of behavior. (Bandura, 1969, p. 229-230)

Behavior modification procedures have often been considered to be techniques for reducing or eliminating "negative" behaviors. Precision teaching is concerned with reducing negative behaviors, but also allows and encourages systematic attempts at accelerating the rate of occurrence of positive behaviors.

Objectives

Purpose

It was the purpose of this study to explore the effect on parents and children of training parents in the use of the precision teaching approach to behavior modification in an effort to increase their ability to manage retarded children at home. Since parents are the focus of this study, rather than teachers, "precise behavior management" may be interchanged with "precision teaching," and will herein after be referred to as PBM.

Questions

The precision teaching method generates empirical data concerning specific behaviors in the process of observing and attempting to

change behavior (Bijou, 1968; Sulzbacher and Houser, 1968). Therefore, it is possible to formulate some questions to be answered on the basis of these data:

1. Will parents be able to learn and implement a precise behavior management approach to behavior modification and management of their child at home?
2. As the parent learns and implements the precision parenthood techniques as presented, will significant changes in the behavior of their individual proteges be achieved, either accelerative or decelerative, as desired?
3. Will the parent be able to exercise more self and situational control as precise recording and behavior monitoring proceeds?
4. Can parents learn to view behavior in terms of the environmental conditions that cause and maintain it, thus coming to react less from emotion or intuition and more from reliance on systematic and objective behavioral change methods?

Subjects and Procedures

Subjects

The subjects were interested parents of either educable or trainable retarded students in Logan and Cache County, Utah. In contacting these parents, a letter (see Appendix A) which briefly explained the program and invited participation was sent to 75 families. Telephone contact was to be made if a low attendance resulted from the letter contact alone. Both contact methods were used, and a total of 20 families were represented at the first meeting. Subsequently, only six families continually participated; and, although this attrition rate seems quite high, it is necessary to evaluate it in light of the information contained in the "attrition" section.

An introduction to the methods and purposes of precision teaching, as well as to the goals of this research project, was presented at the first parent meeting, during which commitment to follow through and cooperate with the researchers was solicited. Volunteers signed up to receive a wrist-type behavior counter which they were told would be theirs when they turned in at least one behavior project. Signing up for the counter thus also constituted an intent to continue with the program. Since this was a study of the feasibility of training parents to manage the behavior of their child at home, those parents who were interested were more apt to volunteer and were the group of concern.

Instrumentation

Individual behavioral information pertaining to both the children and the parents was recorded and charted. Data collection sheets were used for recording and computing performance rate data; and charting was done on six-cycle, semi-logarithmic graph paper as produced by Behavior Research Company, Inc., especially for use with this approach to behavior modification. Examples of both data collection sheets and the six-cycle graph paper can be found in Appendix B.

Each parent signed out and used a behavior counter (a wrist-type golf score keeper) and a kitchen cooking timer with a bell for keeping track of behavior frequency and length of observation. The timer was available for sign-out during the second week.

Procedure

During the 10-week training period, the parents were introduced to behavior management in weekly training sessions designed to both inform and provide some practical supervised experience with the process of precision teaching as an approach to behavior modification. The steps in this procedure, evolved primarily by Ogden Lindsley, can be summarized as follows:

1. Pinpoint the behavior.
2. Count and time the behavior's occurrence in terms of rate per minute.
3. Chart the behavior on six-cycle standardized graphs for ease of common interpretation.
4. Observe the behavior during time samples for several days to determine typical performance.
5. Select and introduce a specific event (environmental change) which may have an effect on the behavior, manipulating events that are either antecedent or subsequent to the behavior.
6. Continue to record and observe the behavior. Any changes will be clearly indicated by the graph.
7. If change has not been observed, or is in the opposite direction from that desired, introduce another event (steps 5 and 6) in a further effort to effect desirable change.
8. Remove the contingencies and continue recording as a method of observing the carry-over effect; that is, whether or not the rate of behavior remains at the changed level.

The parents followed these steps as outlined. Through use of the procedures and concepts presented in each session, including the above

steps, the results and effects of behavior management became readily observable in the records kept. The information thus gathered provided empirical data for making judgments about the efficacy of the specific tactics employed, the program used, the consistency of application, and the commitment of the manager.

Specific contents of each session

There were 10 weekly sessions designed to teach the eight steps listed above and present the principles and procedures in a logical sequence to the participating parents. Some sessions were primarily oriented toward instruction, while others were aimed at clarifying problems and procedures and to assist the parents with application of the techniques.

A concise outline of the content of each individual training session is presented below.

Session One. The first part of Session One was used for presentation of the rationale, background, and utility of the precision teaching approach to behavior management. Specifically, the following concepts were introduced and explained:

1. If we are to learn about behavior management, we need to first understand what behavior is. A general definition of behavior was given; then a specific definition for the purposes of changing behavior was: "Problem behavior is either too much of an undesirable behavior or too little of a desirable one."

2. Behavior needs to be recurring (cyclic) for recording purposes, and has been labeled a "movement cycle" since it must also be observable.

3. You can tell if what you are observing is behavior by asking: "Can a dead man do it?"; and if so, it is not a movement cycle.

4. Pinpointing behaviors is a process of defining the behavior to be worked with to the point where it meets the criteria above.

5. Behavior is acquired in an orderly fashion. Specific rules of learning have been discovered and increasingly understood. These rules are well enough established to make it possible to describe what happens as behavior is learned and maintained.

6. Children learn from their environment, and the things they learn can be bad or good, correct or incorrect, appropriate or inappropriate.

7. If things can be learned, they are subject to change by continued learning and unlearning.

8. New behaviors can be learned to replace old behaviors.

9. All people, adults as well as children, learn from their environment. They learn both good things and bad things, and parents learn to react emotionally and inconsistently.

The need for rate data, its usefulness in analyzing behavior, and its sensitivity to behavioral changes was explained. A brief introduction to the purposes of the research followed, along with an explanation of the need for volunteers committed to follow the procedures as they were to be given. It was pointed out that there was to be no cost to the parents for participation. Participants were accepted on a volunteer basis during a break in the meeting, although there was a feeling that some volunteered as a result of social pressure. After this, the interested parents were instructed in identifying behavior, pinpointing target behaviors for action, and preliminary recording procedures involving both time and incidence of occurrence of the behavior, and two different data collection sheets. For the process of counting behaviors to establish the rate of occurrence, the wrist-type behavior counters were explained and given to the parents if they would sign them out. It was explained that this was a "loan" unless they continued with the program and changed some behaviors; and that if they did, the counters would be theirs to keep.

The parents were instructed to keep baseline data on at least one behavior for the next week, but were cautioned not to attempt to effect changes. This collection of rate data was to be the ticket to the next meeting.

Session Two. This session began by discussing procedural difficulties or other problems the participants were experiencing. After checking on the progress of the records and rate data, simple graphing and charting procedures were presented. The sequence below is the sequence of specific concept presentation or explanation during this second meeting:

1. Specific suggestions for change were offered when the parents talked about their problem behavior projects.

2. Eighty percent of the families in attendance did have some baseline data collected. Only one was a newcomer to the group.

3. One parent had seven days' recorded data on "nail bites," and this was used in demonstrating charting procedures.

4. The six-cycle graph was introduced and explained with a visual aid and an overhead projector. "Up" and "down" on the graph show increases or decreases in frequency of the target behavior.

5. The seven days' data used for illustration was also used to point out the baseline nature of the data. Prediction is possible from baseline data, and as soon as we can predict, we can assess whatever deviations (changes) that can be produced as we try to manage behavior.

6. To effect changes in behavior, changes in the environment are necessary. As we now try to work with behavior, this is labeled the "change" phase.

7. Behavior is related directly to the events that immediately precede or follow it, although the extent of the relationship is also important.

8. Several previous behavior change projects were referred to in the process of explaining each of these points.

9. Manipulations of environmental events should be "natural," rather than "synthetic," as much as possible. The "no bank" and "Sunday box" were explained as being natural applications, and were suggested for possible use at home.

10. Ignoring can be useful, but it has to be done strategically if it is to be effective, since to ignore a behavior can have either an accelerative or decelerative effect on it. Systematically ignoring tantrum behavior was used to explain the correct application. Controlling swear rate was given as a bad example.

11. Provide behavioral alternatives if you are trying to eliminate a behavior, and then reinforce and substitute.

12. Select a goal that will assure success by being within easy reach, and allow reinforcement for successes; e.g., reward for control of tantrum behavior for only a few minutes in the beginning, then gradually increase the criterion, and eventually the reward can be withdrawn without a degeneration in behavior control.

13. Try, try again. Sometimes many things need to be tried before something can be found which will work reliably.

14. Timers have many uses in behavior management programs, such as to aid in controlling the contingencies; in maintaining time intervals (since memory is so fallible); for structuring the delivery of the reinforcements; and for helping with awareness of time for both children and adults.

15. Timers were issued to the parents who wanted one if they would sign for it on the same basis they had for the counters.

After issuing the timers, the participating parents were invited to contact the investigator by phone at any time if they had questions or procedural difficulties.

Session Three. In the beginning question period, the only request was for a re-explanation of rate computation and graphing. The data of one of the participants was used in doing this. It was also used as the basis for discussing possible change tactics with that particular behavior. In the course of the rest of the meeting, several additional concepts were discussed as follows:

1. Refine the pinpoint in order to slice behavior thinner, thus obtaining more data and more room for change, thereby getting a more precise record.
2. Have the child do his own recording, after baseline, to both free you from this and to focus his attention on the existence of a problem.
3. Alternate devices for recording behavioral data (such as by marking on masking tape, paper, skin, etc.) are also available and may be useful.
4. Accelerative change in behavior can often be seen in classrooms just by displaying the child's improvement graph.
5. The most accurate records are obtained when the person who does the behavior also keeps count of it.
6. You can often expect degeneration in behavior after counting is started, partly because the environment is no longer reacting predictably for the subject.
7. Common sense should be used in behavior management; if something looks like it will work, then give it a try.
8. If a child can be involved in the counting, he can also be involved in the programing. Let him choose the procedures wherever plausible.
9. Reversals of procedure or contingencies may be indicated if behavior is observed to change in undesired directions.
10. Substitution is a way of providing competing behaviors to exist concurrently with, and then to replace, the target behavior.
11. Ignoring behavior can serve to either increase or decrease it, and so you have to choose wisely when deciding when and how to ignore.
12. Select more natural consequences for behaviors, avoiding the highly arbitrary (although more often used) artificial or imposed consequences.
13. If the desired changes are not realized, continue to try, then try again.
14. There are many environmental events that can be related to whether or not a behavior occurs, as well as to the intensities with which it does occur. Relationship of environmental events to behavior ("Is" analysis) was discussed.
15. Consistency in all applications of contingencies or in behavior management is absolutely imperative.

16. Organization of motivational factors of children can be conceived of as steplike (Hewett, 1967). Some will work for social reinforcements alone. Others will work for the self-satisfaction involved. Others, however, will not work for either reason, and need some tangible reinforcement. This latter is not a bribe; it is rather just recognizing the things particular individuals will work for.

17. People do things when it is "worth their while" to do so. Adults are no exception. It needs to be made "worthwhile" for children to change their behavior.

18. The extremely individual nature of children (especially handicapped ones) accentuates the need to program individually and to select management procedures on an individual basis.

19. The rationale for removing the behavior management tactics used in the program after getting a behavior change was explained as being necessary and justified for two reasons: one, it is too expensive to maintain over long periods of time; and two, other things begin to support and maintain behavior without the continued need for "artificial" programs.

20. We should not be satisfied with performance just because it "looks" like it is at an appropriate level. See if it can be improved further before accepting it.

At the conclusion of this session, each attending family representative was given a copy of *Living with Children* (Patterson and Gullion, 1968) and requested to read into it by the next meeting.

Session Four. As with the others, this session started off with the invitation to ask any questions that seemed important to the parents. In spite of the fact that the emphasis was expected to be on the behavioral problems of children at home, or on behavioral modification techniques used in working with them, the question: "What can you do about kids in the neighborhood who call others 'Retard'?" came up and was the stimulus for considerable discussion around this problem. In keeping with the major theme, a behavioral analysis of the situations associated with this name-calling was presented, and possible precise behavior management and techniques were outlined and suggested. These could be applied for either working with the name-calling itself or for working with the response of the traumatized child (crying and tattles to mama). Whatever approaches were used, however, the parent was cautioned against overprotecting the child. It was explained that experience was necessary for fostering whatever intellectual development occurs, but that behaviors and experiences should be channeled and managed precisely, in lieu of shielding or overprotecting the child.

Other points that were presented and discussed follow:

1. Because of individual differences, individualization of educational curriculum and procedures are extremely important for working with exceptional children.

2. Group competition that works quite well for some children should only be used when it is anticipated it will be useful. Individual competition and adjustment of our expectancies comprise a more desirable approach to either managing or educating exceptional children.

3. To get the most out of every child, we need to individualize our instruction, our curriculum in the schools, and certainly our training at home as parents.

4. "Little steps for little feet." "I can't" is a learned response when expected performance steps are too large. Smaller steps are indicated whenever "I can't" is encountered. This provides success opportunities, and the possibility of reinforcement for trying and succeeding.

Session Five. In the question and discussion time during this session, the method of entering the correct rate onto the graph again came up. Graphing was explained once more, this time from the standpoint that the 1,000, the 100, the 10, and the one-minute time samples are easiest to work with in terms of both rate computation and graphing. Precision, accuracy, and better data with which to work are realized when the exact number of movements and the exact length of time are used in computing the rate of occurrence of the target behavior, however.

Another question was raised about the earlier concept of programming successes for mentally retarded children, and arranging the behavioral steps so that they are small enough to be accomplished by the individual child.

Other specific things that were presented or discussed during this session were:

1. The most productive way of controlling behavior is by being positive in your approach.

2. The contingency and the consistency of its application seems to be the important variable in whether or not other people can be as effective as the original manager in controlling the behavior of children; as, for example, with baby-sitters.

3. It is, however, quite legitimate to have contingencies in effect only in the presence of one person (i.e., the manager), without it being necessary to transfer the responsibility for the program and/or the contingency to another (e.g., the babysitter).

4. The graphs help us to see small improvements, and be precise in the ways in which we continue to manage each problem.

5. Where possible, teach the graph system to the child. This will help him see exactly when he has done better or worse. It also allows precise (and unemotional) control of the contingencies that have been established.

6. If a consequence is selected and promised (or threatened), be prepared to follow through with it. Caution: don't promise or threaten something that you do not intend to carry out.

7. Knowledge of reinforcement schedules permits us to make some limited statements about approaches; e.g., "As soon as . . . " is a schedule that gets individuals started quickly and keeps performance rate high until the time of realization of the reinforcement. Other common reinforcement schedules were also explained.

8. Deterioration (as opposed to improvement) in behavior is often noticed at the start of the baseline collection phase. Primarily, this obtains from increasing ability to recognize the problem movement and improvements in awareness. The more we recognize behaviors and are aware of their occurrence, the more accurate our recording will be. This does not mean to say that there has been a real deterioration in performance--just that sometimes more accurate records give that illusion.

9. Precise information is necessary for many things other than behavior. Loss of appetite, for example, is only serious when precise information shows that too much weight is being lost. If it is important to be precise in this way, then it is equally important to be precise when dealing with behavior.

10. Selective ignoring of problem behavior, when paired with praise (or attention) for desirable (competing) behaviors, as in Patterson and Gullion (1968), functions to reduce the frequency of occurrence of the undesirable behavior, and increase the frequency of occurrence of the desirable.

11. It was restated that the things most often associated with successful management programs are the things most closely associated with the behavior, as the antecedent events and the subsequent events, including the ratios between these events and the movement cycle in question.

12. Who is it that you select to become friendly with? It is people who respond to you in friendly or positive ways. By controlling children in negative ways, then, could this mean that we are teaching them not to be friendly with us?

Session Six. This session was only an hour and a half long, and consisted primarily of discussing the projects of the parents in attendance. Midway through the meeting, it became apparent that the illustrations and applications being discussed were centering upon the use and results of forceful and/or punishing contingencies applicable to child management (e.g., beating, commanding, threatening). Considerable time had been devoted during the previous sessions to pointing out the ways in which PBM could help the parents establish positive behavior controls, and the last 30 minutes of this session were used to suggest the use of other than negative or forceful

controls. In addition, the application of contingencies designed to lead to results which would make "good" behavior worthwhile to the child were discussed. A specific example of changing the emphasis from negative to positive controls was "sibling aggression." When children fight (verbally or physically), punishment is often used by parents as a negative method of control--perhaps because parents are bigger and stronger than children and because it is easier to do than working with the situation. A better approach (the positive way) would be to manage the situation, arranging events in such a way that it becomes worthwhile for the children to stop their fighting. This takes more effort, usually requiring that you recognize and reinforce desirable (or competing) behavior and arrange for recognition and reinforcement of concomitant decreases in the frequency of occurrence of the undesirable behavior.

In connection with this, a "little steps for little feet" concept was again stressed. Briefly, this entails planning for successes by having the behavioral goal within easy reach of the child and expanding the requirements as the data indicate to be possible.

Session Seven. Each parent's project and the progress in working with it was discussed. There were few specific questions. The remaining time was used in discussing, elaborating, or presenting the following concepts:

1. Consistency is one of the largest single factors in the success or failure of child management.
2. Don't be afraid to use difficult problem areas as targets for behavior change; e.g., coordination problems in riding a bicycle. Make bicycle riding part of his curriculum. You'll not only help him improve, but you'll program yourself for more involvement and systematic assistance.
3. By making things meaningful to children, mothers can train them to like things that other children would not like; e.g., to play outside in the rain during a storm.
4. When the parent records something that is not strictly observable, such as lies, there is an increased chance of modifying the behavior in an undesirable direction, in spite of the fact that procedures and programs used are sound both theoretically and in practice.
5. Shaping is a process of building behaviors much as a sculptor would build a vase. Starting with the raw material (problem behavior, as defined earlier), and by rewarding successive approximations to the target behavior, one can obtain correct, if not sophisticated, behaviors.
6. The three things that are necessary in approaching behavior management are: (a) problems must be recognized; (b) performance must be determined; and (c) strategies must be developed for approaching management of the problem behavior.

7. Sometimes several behaviors are inter-related, as for example, the mother who yells at her child who is disobedient. Decreasing one is likely to be associated with decreases in the other. These two behaviors can be thought of as: (a) the "target behavior"; and (b) the "corollary behavior."

8. After you get a change in behavior, in the direction you want, is it necessary to continue with the strategies used thus far? Sometimes it is, and sometimes it is not. To be sure that you're not wasting your time, energies, and programs, continue to monitor the behavior in question without the use of the programs or contingencies used during treatment. If the behavior maintains or improves, it was correct to stop maintaining it artificially. If it degenerates, on the other hand, the program was removed too soon or it was only prosthetic in nature and not really therapeutic.

9. Specific examples were used in illustrating many of the concepts under discussion. As in all sessions, examples were from actual cases and were presented visually via the overhead projector.

10. By keeping precise records, we know when it's time to intervene. We also know when our tactics are associated with improvements in behavior. Records can also tell when a tactic is having an opposite effect on behavior, and can suggest certain alterations in approach which may contribute to its efficiency.

11. Teachers have employed behavior management tactics since time immemorial in controlling the behavior of their students. Precise behavior management differs in that procedures are used with consistency and with evidence and escapes responding from emotional hyper-reactivity.

12. Acceptance ceilings (and acceptance floors) can program some leeway in approaching behavior management projects. An acceptance ceiling is a way of denoting, both graphically and in terms of occurrences, the upper limits of behavior tolerance that are allowable. Conversely, an acceptance floor establishes the lower limits necessary to minimally meet criteria. In the absence of these limits, inconsistency and the possibility of reinforcing improper behaviors are greatly increased.

13. Acceptance floors and acceptance ceilings establish the tolerance limits; and by so doing, they relieve the parent from enforcing arbitrary or abstract "rules." If the child then perceives a "villain," it is in his own behavior, rather than in the way his parent enforces rules.

14. Many problem behaviors have previously been ascribed to physiological causes or have been said to be dependent on maturation. An example of this is toilet training and enuresis. While there are certainly some physiological aspects to both, there is much evidence supporting the effectiveness that has been achieved through operant conditioning techniques applied to these problems.

15. In association with tactics employing tangible reinforcers or programs which are impersonal, always pair successes with social reinforcements such as praise, physical contact, and smiles.

16. Easier and more rapid control of children is possible if parents use negative, rather than positive, control techniques. Positive controls work better, however, and this suggests the need for using these same behavior management tactics with adults to change their behavior toward becoming more positive in the approaches they use.

17. Bite counting is a good logical approach to weight reduction. The consequence of taking too many bites is an increase in weight. By programming a reduced bite-intake, weight can be controlled without the familiar problem of limiting the kinds of food you can eat. By approaching weight control from a behavior management standpoint, the program flexibilities make it an entirely tolerable (and historically successful) way of controlling weight.

Session Eight. The specific concepts either presented or discussed in more depth during this session included:

1. Weight is a function of behaviors, and can be controlled with a behavioral approach. Start with a baseline of a related behavior (e.g., swallows or bites), then reduce the number of bites in the day until the desired weight loss rate is obtained. Maintaining a lower bite rate will maintain a lower weight.

2. Median rates of behavior are found by counting up from the lowest rate until the middle rate is reached, and that is the median. With an even number of observations, the median rate is between the two middle observations.

3. Plotting rates on the graph was, once again, explained. Mechanical plotting aids were introduced, but were even more confusing to the parents, and were dropped from instruction.

4. The importance of data sheets was emphasized once more, since there was indication of graphing problems, and since it is important statistically to have rather precise rate information.

5. The importance of baseline in predicting the future occurrence of a behavior was again shown, and the significance of this for probability computation explained.

6. Obtaining a 2 x 2 table from the data was illustrated. It was explained that this is used in computing the probability of the behavior change occurring by chance.

7. Probability of change in observed and graphed behaviors was explained, but the statistical and mathematical procedures were not presented. Parents were told that the investigator would compute all of these. They were told, however, that they could use a simple,

although not entirely accurate, exact probability approximation table. This would allow them the advantages of knowing the probabilities of change in their projects without having to go through the laborious computation procedures. Most parents did not express too much interest in doing this, however, and the subject was dropped.

8. The behavior and the environmental changes employed in the study by Morrey (1969) were explained: a student's high rate of spelling errors, and how they decelerated concurrent with increases in teacher encouragement and with a warm-up period prior to the spelling period. This was also explained in order to show how the behavior of an adult often needs to be changed (and can be changed) in managing the behavior of others.

9. The precise record shows immediately just what effect we are having on behavior, and allows future management planning to be done on the basis of empirical data.

10. Some behaviors change simply as a result of counting them. Counting causes awareness of the behavior, and changes in the behavior of children are often associated with the knowledge that someone else is interested in their behavior.

11. Environmental arrangements and consequence arrangements are necessary, but it is only when these arrangements are consistently present or consistently enforced that they exert their maximum influence on behavior.

12. People, and especially young people, tend to test the rules. If rules are in operation only part of the time, they wouldn't be as effective as they would be if they were consistently applicable.

13. One of the reasons for keeping the data is that you can tell immediately if something goes wrong, and then you can change things again. This is what is meant by "try, try again."

14. Rates of performance of behaviors should not be accepted simply because the behavior in question is resistant to change. Satisfaction with behavior is only possible if several tactics have been tried, several motivating events employed, and every effort made to improve it.

Session Nine. There were no opening questions and certain concepts relating to behavior management were expanded upon, presented, or discussed. The following is a listing and brief explanation of them:

1. Desensitization is a useful procedure to use with certain cases, and is a helpful concept to understand. Basically, desensitization is achieved by eliciting (or allowing to occur) behaviors that are fearful or which show avoidance, and by doing this in combination with pleasant situations and events.

2. Precision teaching is only beginning to be incorporated, to any great extent, into our teacher-training programs, but it is extremely important that teachers know these methods and this approach--perhaps even more important than that parents know them.

3. Premack's (1965) principle, stated simply, arose from the postulation that you can tell what people like to do by observing the things that they do. If you can manage the contingencies in such a way that the high-probability behavior can be entered into upon satisfactory completion of a low-probability behavior, it is possible to increase the performance of the low-probability behavior and decrease the performance of the high-probability behavior.

4. Negative practice (and a very related procedure of satiation) can often be used to bring behaviors to the level of awareness necessary to begin working with them. Habits are sometimes so unconscious that they are engaged in simply because they are there. Becoming aware of some behaviors that are habitual may be reason enough to decelerate them, and that is one reason why many behaviors can be managed by simply counting them, as in this approach to behavior management.

5. The "little steps for little feet" concept of behavior building was again mentioned. When too much learning is expected, and failures occur, then perhaps smaller learning steps could be employed. The result would be more efficient learning.

6. Reinforcers are more effective when they are closely associated in time with the behavior you want to reinforce. The further away in time the reinforcer occurs, the less chance there is that the reinforcer will be associated with the correct response. One implication of this is that punishment on a delayed basis is not likely to be very meaningful and therefore should be avoided.

7. When two children fight and later become friends, this possibly occurs because they provide immediate punishment to each other for fighting. One would expect this to have considerable meaning for each of them; i.e., that it is not worthwhile to fight with this particular opponent.

8. Differential responding is expected from each child. Some can operate for one reason, while another reason is needed in order to get another to perform.

9. Offering a choice of alternative ways of behaving can often be used with children quite effectively. The effect this has is of getting the job done without giving the third choice of noncompliance, which would be more available if a directive was issued to do a thing one way only.

10. Consequences selected for use should be considered from several standpoints. One is the "natural" vs "synthetic" consideration. Another good way is to select a consequence that, if realized, would complement the goal of behavior change. An example of this latter

method is to program jogging (or weight-lifting) as a consequence for overeating.

11. A couple of rules concerning appropriate times for introducing changes were presented. One was that if you can see a behavior is likely to be adversely affected in the next few days, it would not be feasible to change at this time. When you would predict the possibility of improvement, it is a good time to change. The second was concerned with empirically using the graph to help make these predictions. On a day when behavior is much lower in rate than in the days just prior, it is an appropriate time to change if your target is deceleration; but it is very inappropriate if you are trying to accelerate the frequency of occurrence of the target behavior. Just the converse is true when the observed behavior rate is much higher than on the few previous days.

Session Ten. This session consisted entirely of the following three things, in order of occurrence:

1. The parents' oral presentation of the projects that were undertaken during the preceding 10 weeks.

2. A reaffirmation of the importance of the concepts explained in the previous sessions, including encouragement to continue using PBM tactics in the management of their child at home.

3. Class evaluation.

RESULTS AND DISCUSSION

Prior to discussion of the questions posed at the beginning of the research, the characteristics and success ratio of the parents who continued throughout the project will be presented, followed by graphic and narrative reports of the specific projects attempted by each parent. Based on a compilation of these results, each of the originally posed questions will be answered and discussed. In addition, there were other findings generated by this study which will be presented and discussed in the final part of this section.

Participation

Prior to discussing the results associated with each parent, it is necessary to explain something of the characteristics of the parents who stayed in the project. The initial criterion for continuance-discontinuance was that attendance at more than two sessions constituted continuance. Attendance at only one or two sessions, conversely, constituted discontinuance. Table 1 presents the information regarding participation and success at precise behavior management (PBM) figured on this basis. The six who continued did so with nearly perfect attendance during the remaining sessions.

Table 1. Participation, involvement, and success of parents in this study

Number of families				
Contacted by letter or phone	Attended first session	Signed up	Dropped out	Continued
74	20	18	12	6

Percent continuing who		
Did not attempt a project	Attempted one or more projects	Succeeded with at least one project
17	83	83

It must be pointed out that this project was designed to train both mothers and fathers in the basic procedures. However, only three of the fathers accompanied the mothers to at least half of the training sessions. It was clear that they were providing support, rather than actually attempting to modify the behavior of their children. One father attended only one session, but was reported by the mother to be very supportive. In another case, it is not known what the involvement of the father was. In the sixth case, there was no father present in the home.

It is important to point out that the one parent who did not try, and therefore failed at modifying her or one of her child's behaviors, attended only three sessions. Excluding this one person for this reason, it can be reported that all of the parents who attempted to change behavior succeeded in doing so using the suggested techniques.

Participant enthusiasm

Not only were the parents trained to become precise behavior managers, but they also became rather adamant supporters of Precise Behavior Management (PBM) as both an effective technique and a comfortable and productive framework within which to approach all human relationships. This striking change in parental behavior was brought about within four to six weeks using two-hour sessions each week, with parents actively engaged in employing the PBM procedures and philosophy.

Comments on PBM and the class were obtained from parents in two ways. The first and most reliable way was responses they wrote on a class evaluation form at the completion of the 10-week parent training program. There were no negative comments made, and randomly selected samples of the positive statements made by parents include: "This program should be opened to all parents, not just parents of handicapped kids." "The program . . . is more valuable to me . . . because I am aware of problems." "I am grateful to [the experimenters] for [the program] and the helpful suggestions." "The class helped me so much personally."

The second way in which parents' comments toward PBM were obtained was by tape recording the individual weekly sessions. In the process of monitoring these comments (often spontaneous--sometimes elicited), it was noted that very enthusiastic and positive responses were being made by some individuals as early as the fourth week. The following are some samples of these parent comments: "Could you let me know if there are going to be any more of these programs for parents?" "All parents and all teachers need to have this training." "It sure has helped me understand the kids and myself much more."

There continued to be many positive responses made throughout the program, similar to the above examples.

An unexpected development occurred near the end of the project. Parents began asking about teacher training programs and about the possibility of getting their children enrolled in programs in which the teacher had been trained in PBM techniques. There were also several inquiries regarding whether or not any future parent training classes were to be offered. Most of the parents had relatives or knew other parents who would be interested in attending if possible.

Several copies of Patterson and Gullion's book, *Living with Children*, were requested by the participants for the express purpose of giving them to people not associated with the program. Hopefully, advice and helpful information about the implementation of PBM techniques and rationale were given, along with the books.

Attrition

Of the 20 families who were represented at the first meeting, 18 signed up to continue. Of these, only six attended more than two sessions. The attrition rate needs to be evaluated in perspective. Attrition rates in another recent study, using a similar approach, and starting with a fairly high number of parents, were also quite high (Lindsley, 1969). In that study, 70 percent of the signees never came, dropped out, or did not try. In the present study, we attempted to identify some of the reasons for a similar attrition rate.

Results of a questionnaire (Appendix B) sent to parents who dropped out show that attrition was due to several outside factors, including the time of the year (summer) and the increased possibilities for competing activities (camping, vacationing, picnicing, etc.), and the presence of daylight savings time (meetings held too early). These factors are basic to some of the recommendations made in the next chapter.

In the same follow-up questionnaire, which was sent to each parent, the question was asked: "Briefly, what was your reason for not continuing the course of instruction in Precise Behavior Management? (Please comment)." The reasons given by the parents were usually specific and warranted dropping out. Eleven of the 16 families who had not participated in more than two meetings gave specific reasons, as follows (in order of receipt):

1. Husband's work shifted to evenings.
2. Illness.
3. Husband left to South America--house guests in summertime.
4. Works late on construction--wife works nights since school is out.
5. Only parent--worked evenings after three sessions.

6. Could not attend after change to Wednesday evening.
7. Husband left town--no car and 25 miles in to meeting.
8. Child in special school--vacation--too many competing activities.
9. Husband had heart attack--neither parent could thus attend.
10. Time conflicts on meeting night.
11. Moved to Provo (150 miles away) when school ended.

Looking at the attrition rate in light of this additional information, only one family appeared to stop attending without defensible reason (number 8).

In planning this training program for parents, two things were overlooked which had direct bearing on the participation rate. One is that such a high rate of attrition-producing influences was not anticipated. The second oversight was the deleterious effect that could obtain from the seasonal influences of the time of the year during which this parent-training program was conducted.

Dropout enthusiasm

Successes with PBM were not restricted to those parents who continued in the program. Several of the parents who were unable to continue would have liked to have done so. In some instances, behavior changes were reported even though the dropout parents had only a basic orientation to counting and recording specific pinpointed behaviors at home.

The previously mentioned questionnaire (Appendix B) which was sent to the dropouts also left space for responses to this request: "Please give your comments on that part of the program you did attend." All except two of the parent responses were very positive, with most replying that they wished they had been able to continue. The following five comments are representative of the responses:

1. "We appreciate the help we received in the classes we were able to attend. We regret that . . . we are unable to complete the course at this time."
2. "I think the idea is good. For me personally another time of year would be better."
3. "It was good and wish we could have attended more. We are moving on August 1st."
4. "I was very impressed I wish I had been able to follow the sessions through."

5. "This is a fine program, much good should come from it for the people who attend."

Behavior changes

Individual behavior management projects were attempted and reported by each parent throughout the study. The first behavior change reported by a mother cited "mind-changing" as the single most important problem behavior of her child. The mother told the child she was going to count the behavior and in the next seven days, the behavior occurred only once. On the evening of the second session, the mother explained that "mind-changing" was no longer a problem. She then decided to work with the same eight-year-old child on thumbsucking.

It is significant to note that some of the parents reported having engaged in projects on which they kept no data. A few of these projects were reported by the parents in writing, but many more were not. Those that were reported are included herein, but it must be pointed out that many more behavior changes and much more behavior management occurred than is specifically explained in this report.

For purposes of clarity and ease of interpretation, each of the following behavior projects has been put on a graph similar to every other graph used in this report, but some individual adjustments were made. This has been done for two reasons:

1. Many parents did not use the six-cycle, 140-day graph to begin with (because they did not understand it).
2. Too much space would have been taken if each project had been reported on the six-cycle, 140-day graph in this publication. This would have also shown the data in a diminutive form which would not contribute to clarity.

Individual behavior changes of parents or children are reported in order of descending probability of occurrence by chance as measured by Lindsley's (1967) mid-median adaptation of Fisher's Exact Probability Test (Siegal, 1956).

Sherry

The problem behavior that bothered Sherry's mother more than any other was one which she labeled "littering." She was troubled when any member of the family neglected to put things away. Sherry, her retarded child, was "the worst." She left whatever she was playing with wherever she tired of it. The mother thus pinpointed this behavior and labeled it: "playing messes left." After two days of collecting data, Sherry's mother decided to tell her that she was counting the number of messes and was going to make a graph of the results. This simple procedure resulted in a decrease in the behavior, but not enough to fully satisfy the mother (Figure 1).

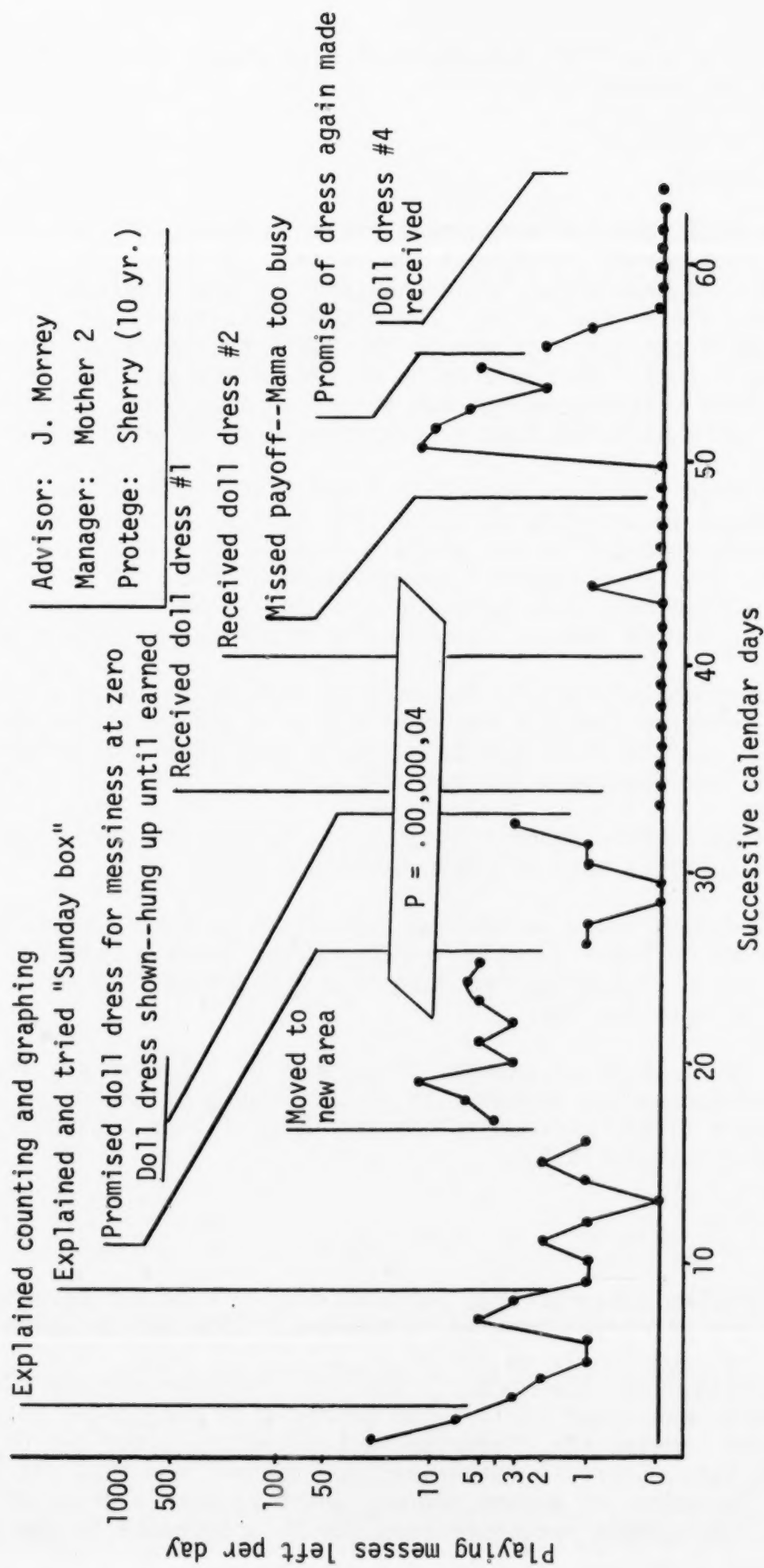


Figure 1. Messiness of child shows relation to environmental changes, both natural and manipulated.

The mother tried two different behavior change tactics. The first was a tactic suggested in one of the parent meetings. Everything Sherry left laying around was put into a box and could not be reclaimed again until Sunday. This strategy produced further improvement, but the family moved to a different home after the procedure had been in effect for only one week. Moving thus interrupted the consistent application of this procedure, and for several days there was no contingency management program in operation. At a parent meeting, it was brought out that Sherry really liked doll dresses and the mother decided to devise a program to take advantage of this. Sherry was promised that she would be given a doll dress if she could eliminate her behavior of "leaving playing messes" for one week. Some improvement was immediately noticeable, but not any better than had been achieved with the "Sunday Box." In the meantime, the mother had made a doll dress which she hung up out of the child's reach. The mother once more explained how it could be earned and that it had to be earned before it would be given to her. The next day there were no playing messes left and the dress was given to Sherry (along with praise and other social reinforcement) as a reinforcement for her improved performance. For the next week, there were no messes left around the house, and another doll dress was earned.

In the week that followed, the mother recorded only one playing mess left, and would have given Sherry another doll dress--except that she had been "too busy" to get one made and therefore could not follow through on her promise. Two days after reinforcement should have been given, messes began to recur, and occurred at a fairly high rate until another doll dress was "in sight." As soon as the dress was in view, the rate of mess-leaving decreased to zero. In the words of the mother: "Now at the end of the tenth week of this class another doll dress is waiting if Sherry keeps things neat."

Of all the behavior projects reported herein, this behavior change is the one most highly and directly associated with environmental variations. The probability of the change is strongly associated with both promising and delivering a doll dress for improved behavior; in fact, the chances for such a change occurring without the environmental changes is four in ten million ($P = .00,000,04$).

Drew

Drew, an 11-year-old child with Down's Syndrome, interrupted others and made negative statements to the entire family, especially to his older brother, Daniel. This was very irritating to the mother and she labeled the behavior as "bugging Daniel." While collecting baseline information, the mother counted and recorded between 10 and 25 occurrences per day. She then gave Daniel the counter and asked him to do the counting. Drew's negative comments averaged only 10 per day for the next week. At this point, Daniel went to summer camp and no record was kept for one week. After camp was over, four more days of baseline were recorded. This information is presented in Figure 2.

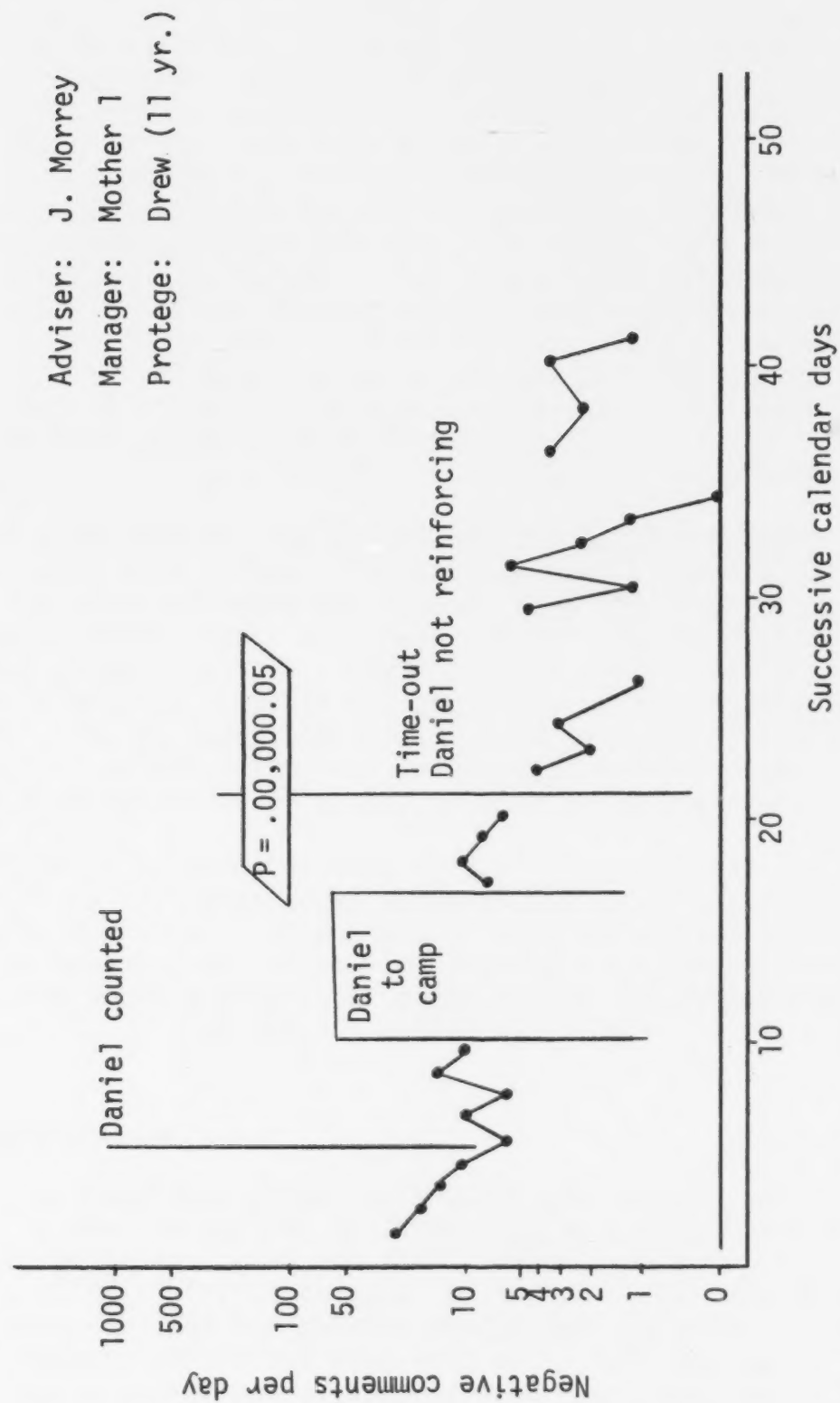


Figure 2. Drew bugs Daniel only 20 percent as often when time-out procedures are employed.

It was apparent to the mother that direct intervention tactics were needed. She told Daniel that he was reinforcing the occurrence of negative comments by replying to them. From this point on, Daniel was to ignore them. In addition, the mother instituted a "time-out" procedure for Drew, which consisted of "putting him in the bathroom for five minutes when he bugs Daniel." With these procedures, the average rate of negative comments was reduced to two per day--only 20 percent of its baseline intensity--for the following three weeks. The probability of this change occurring by chance is extremely remote ($P = .00,000,05$). The mother reported that these procedures continued to work very well, and that Daniel's behavior was also changing in that he reinforced Drew less often.

Mother 1 (self-project)

Some of the projects were carried out to alter the behaviors of the parent. One such project can be reported in the mother's own words as taken from her taped explanation to the group:

I noticed that, with the 20 different people I work with, I let opportunity after opportunity pass when I could've been supportive, and wasn't. I just took things for granted--we were busy, and things should be done just because it was part of our job. We just took [behavioral data] while I was at work (six days a week) and at home on the weekend. I decided it was just something that we had to change.

Figure 3 presents this data graphically.

While I was collecting the baseline information, no one knew what I was counting. They had about a dozen different conceptions. I noticed that other people became more appreciative without even knowing what I was doing. Then the change came. The change was that I told everyone. And I noticed people became even more appreciative after I changed. I think the thing that helped most was the awareness of the problem, and that everyone else around me was aware of it and aware of the scoring. It just changed the whole outlook. Not many opportunities to be nice are missed any more. And it works at home, too. Just to notice the things that people do, and comment on it. They appreciate it, and it makes them try harder.

From the data on the graph it can be seen that the change was quite rapid and complete. The probability of a change such as this occurring by chance is only twice in one hundred thousand times ($P = .00,002$). The graph also indicates that the change was long-lasting, as the occasional spot checks indicate a zero rate of occurrence.

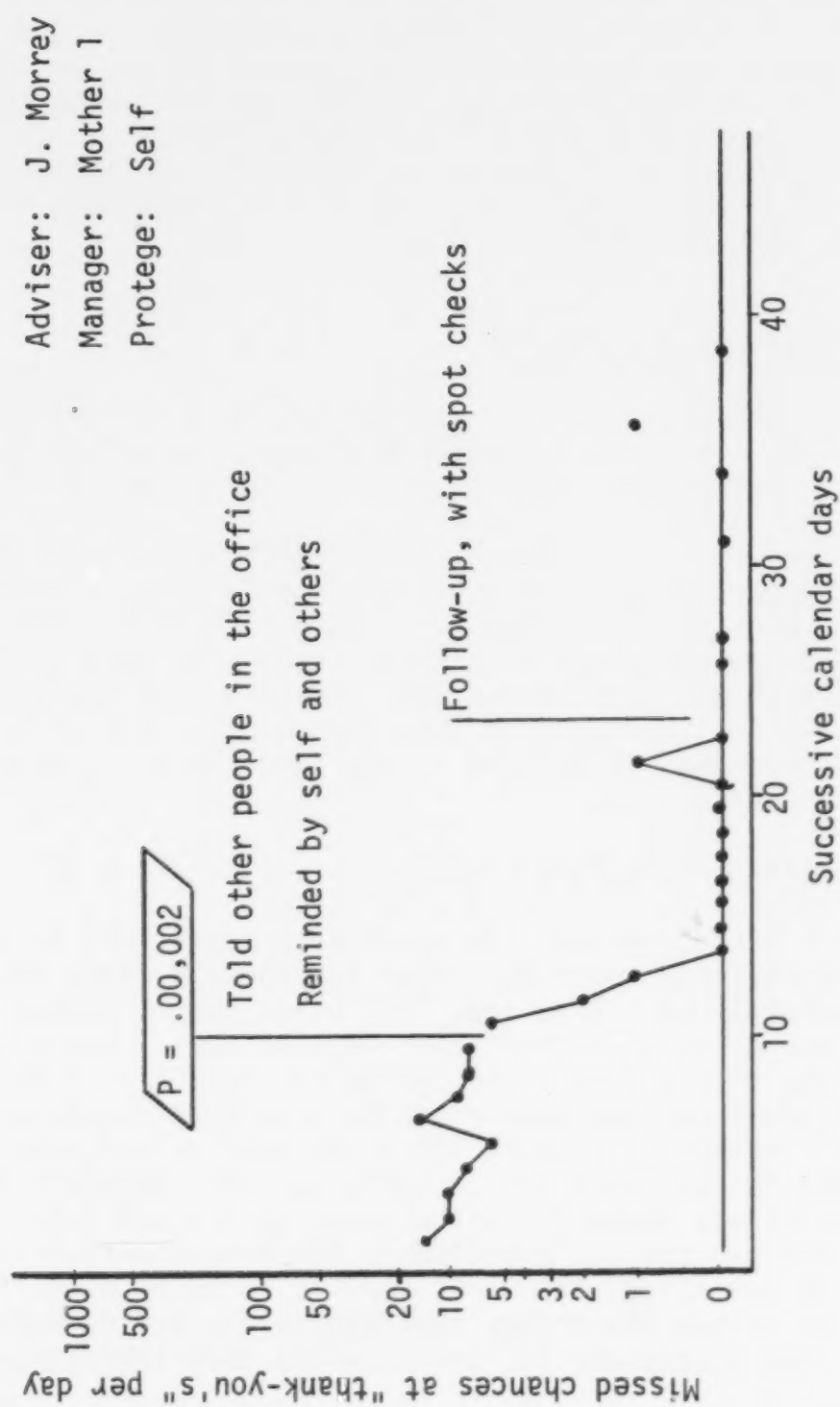


Figure 3. Working mother becomes more appreciative at the office-- reports that co-workers do too.

Willie (first)

Willie used to just "turn up missing" during the afternoon, neither asking if he could leave nor telling where he was going. He would be gone most of the afternoon. He would return and then often be gone again without anyone's knowledge. The days when this did not occur were days when Willie just didn't go anywhere. This baseline information can be seen in Figure 4.

Willie's mother kept baseline data and waited until Willie mentioned that he was going. She seized that opportunity to give him praise and candy for telling her where he was going. She also told him that every time he would tell her where he was going (or asked to go) he would be given some more M&M's. There was an immediate change in Willie's behavior; he began to ask every time before leaving. His mother reported that she always gave both praise and candy whenever he asked to go. Only one time in the following two weeks did Willie fail to ask his mother when he wanted to go visiting.

This child's behavior was called "troublesome" by the mother--but after she applied a few simple PBM techniques, his behavior was no longer a problem. The chances of this change occurring by chance alone are minimal--only three in one hundred thousand ($P = .00,003$).

Willie (second)

When Willie would go (with or without permission) or when he was returning from group functions, he would show up very much later than the mother thought he should. Figure 5 shows that Willie returned home tardily during baseline one or two times a day on the average.

Concurrent with her project to reward Willie for asking to go when he was leaving, his mother explained to Willie that he could obtain candy (and praise) for coming home promptly. From this point on there were only two occasions when he was tardy in two weeks. Willie began arriving when expected on the second day of the project. The change was instantaneous and quite significant ($P = .00,02$, or two chances in ten thousand of this change occurring by chance).

Randy

Randy engaged in a form of behavior which his mother had found "intolerable," but which had previously eluded change despite several attempts in the months and years prior to the parents' attendance at this training class. With much strength, Randy would hit his sister on several occasions each day (median--three times per day during baseline). This was the single biggest problem behavior the child engaged in, so the mother was encouraged to work with this behavior first.

Adviser: J. Morrey
 Manager: Mother 3^a
 Protege: Willie (8 yr.)
^aKept data but not the graph

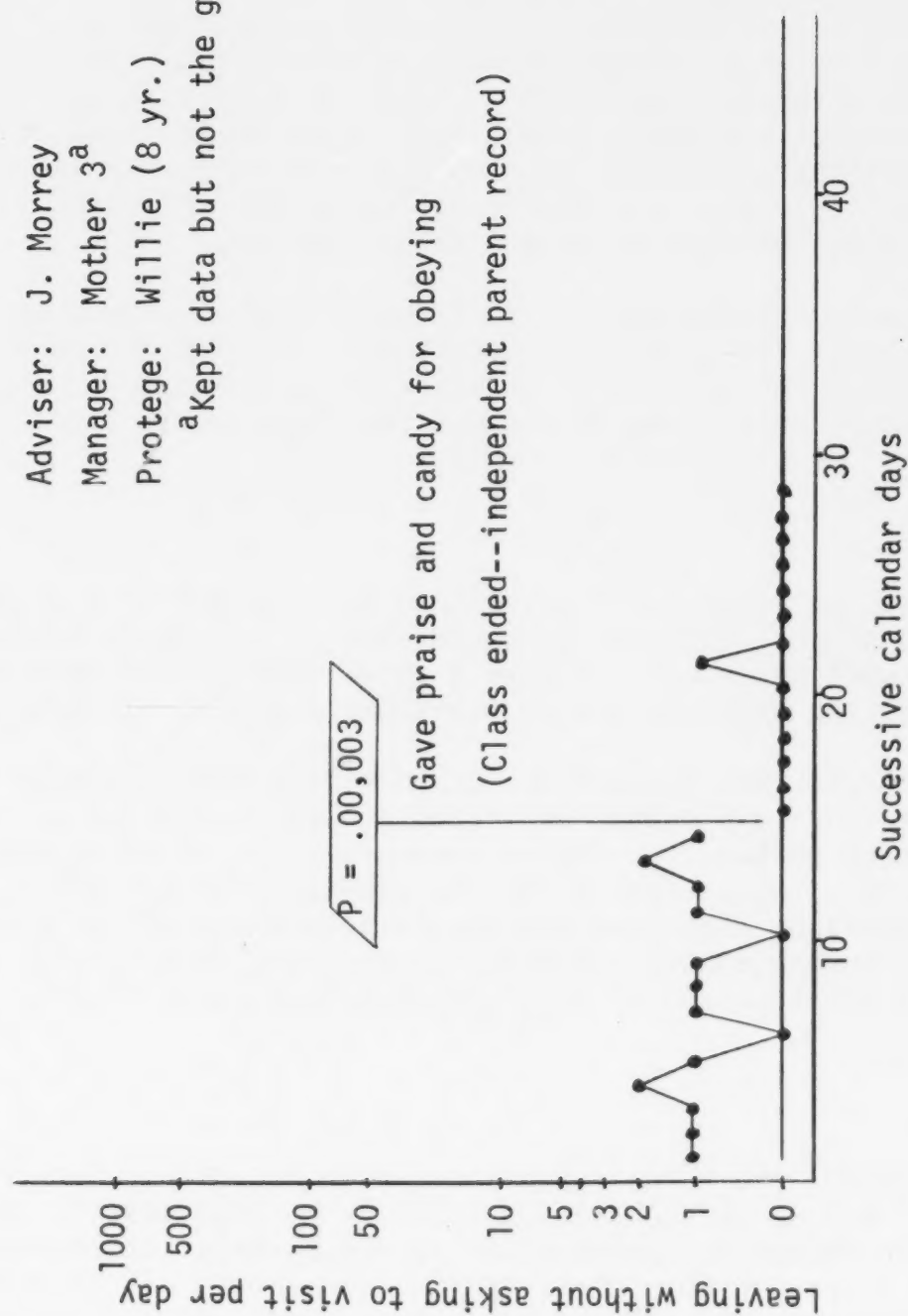


Figure 4. Previously worrisome child now asks whenever going to visit playmates or neighbors.

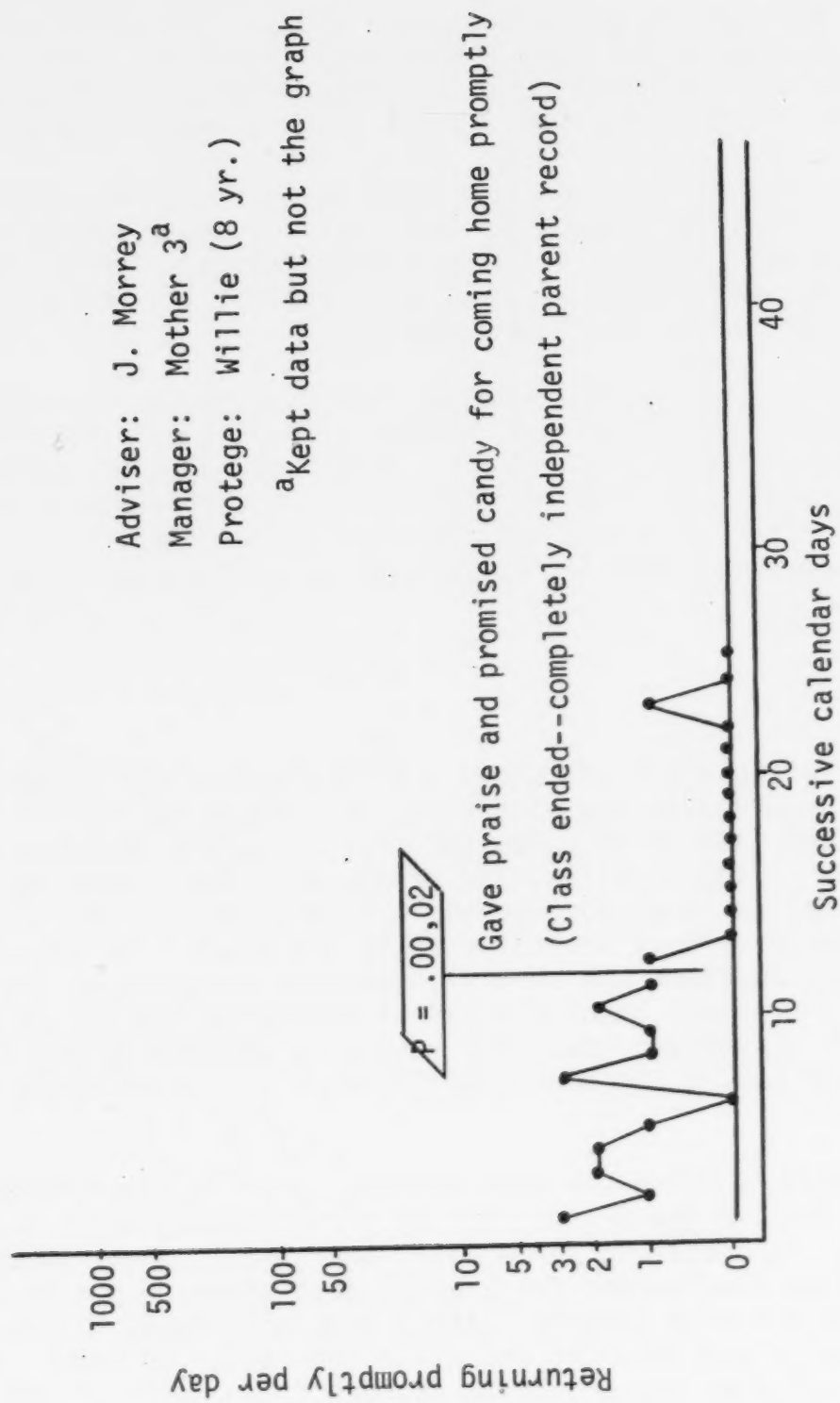


Figure 5. Previously tardy child now returns home promptly.

Adviser: J. Morrey
 Manager: Mother 3^a
 Protege: Willie (8 yr.)

^aKept data but not the graph

Randy wanted a bicycle very badly. Since the potential reinforcer was already there, the mother had only to establish a contingency system leading to its acquisition. After hearing of "token economies" in class, it was decided that paper money would be given toward the purchase of a bicycle (Figure 6). Following baseline, it was initially explained to Randy that he would have to go all day without hitting his sister before he could be given his paper money. The paper money was always given in combination with lavish social praise. This "token economy" system was associated with a marked decrease in hitting, but this did not suit the mother, who wanted it to cease completely.

At this point, it was suggested that perhaps reinforcement periods were too long. Instead of once per day, reinforcement was to be given three times per day. These shortened reinforcement intervals were scheduled for mid-afternoon, evening, and bedtime, in keeping with the concept of "little steps for little feet."

As this procedure was implemented, the hitting occurred with reduced frequency, and Randy received his bicycle after going 12 of the last 13 days without any hitting. In three follow-up weeks, there was only one occurrence of hitting, which the mother reported as "justifiable." The low probability of this change occurring by chance ($P = .00,03$) indicates that the token economy with backup reinforcement was effective.

Willie (third)

The behavior that most bothered Willie's mother was thumb-sucking, which usually occurred in the afternoon, and always at night. This behavior occurred five to 12 times per day during the baseline period (see Figure 7). After baseline, the mother discussed counting and graphing with Willie, and promised him a reward (of his own choice) if he would go for three days without sucking his thumb. At the same time, the mother reminded him verbally whenever she noticed his thumb in his mouth. At night, both as a way of reminding him and as a "behavior seal" (Lindsley, 1968) for recording whether or not thumb-sucking occurred during the night, Willie wore a pair of light cloth gloves.

Overall thumb sucking was decelerating steadily (from seven or eight per day down to one or two per day ($P = .00,04$)) until a short hospitalization was required for a minor operation. Night thumb sucking ceased being a problem except for a while just after he was hospitalized, when it recurred briefly. After five more days, Willie had earned his reward, and after it was given, he said, "Oh good! Now I don't have to watch my thumb sucking so much." In spite of the fact that the mother offered a different reward, Willie continued his thumb sucking, but at a rate only about half as high. The mother reported that she was continuing the program, and was going to institute another environmental change if more improvement was not shown soon.

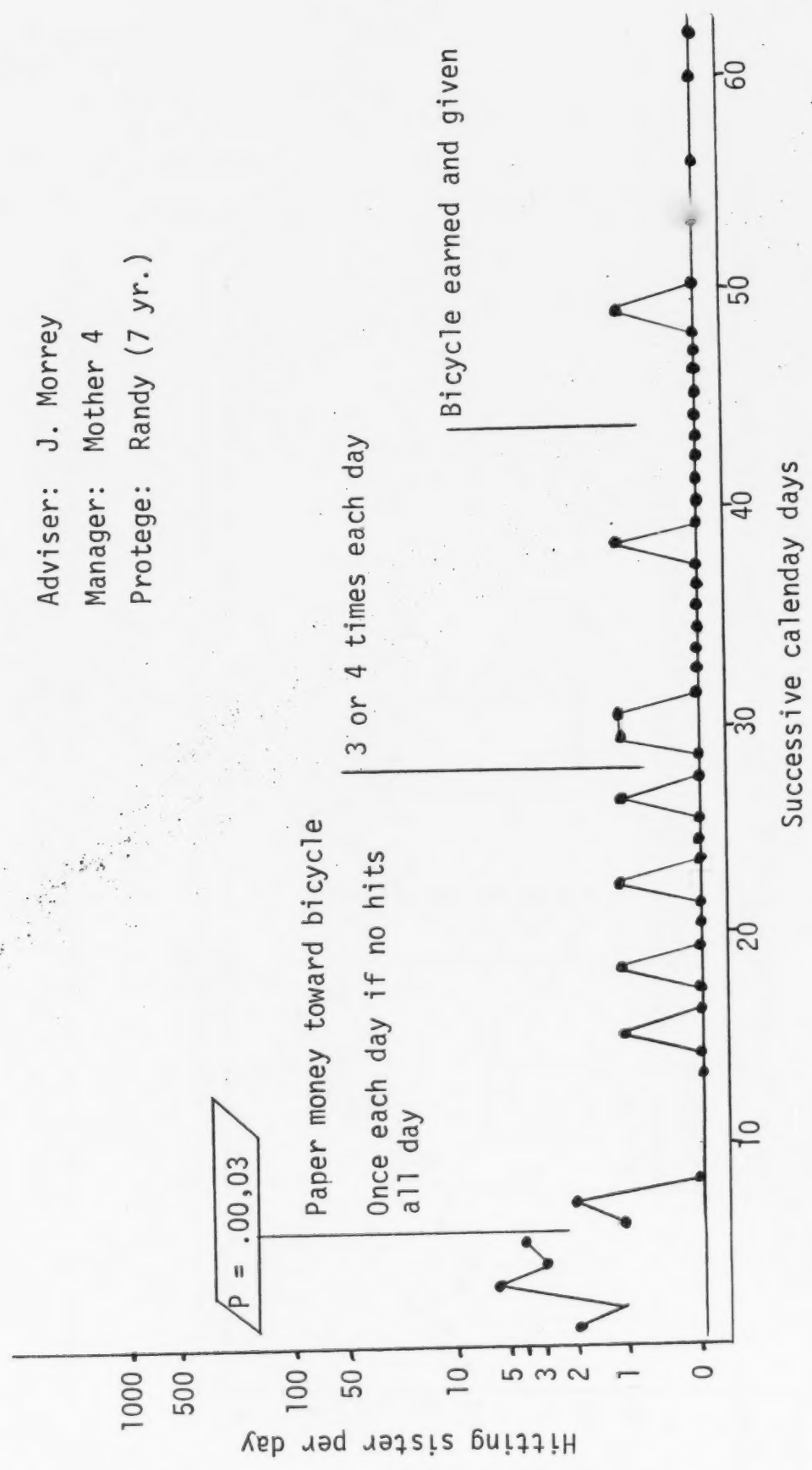


Figure 6. Distressing and intolerable behavior decelerates and extinguishes in association with mother's systematic reinforcement program for a bicycle.

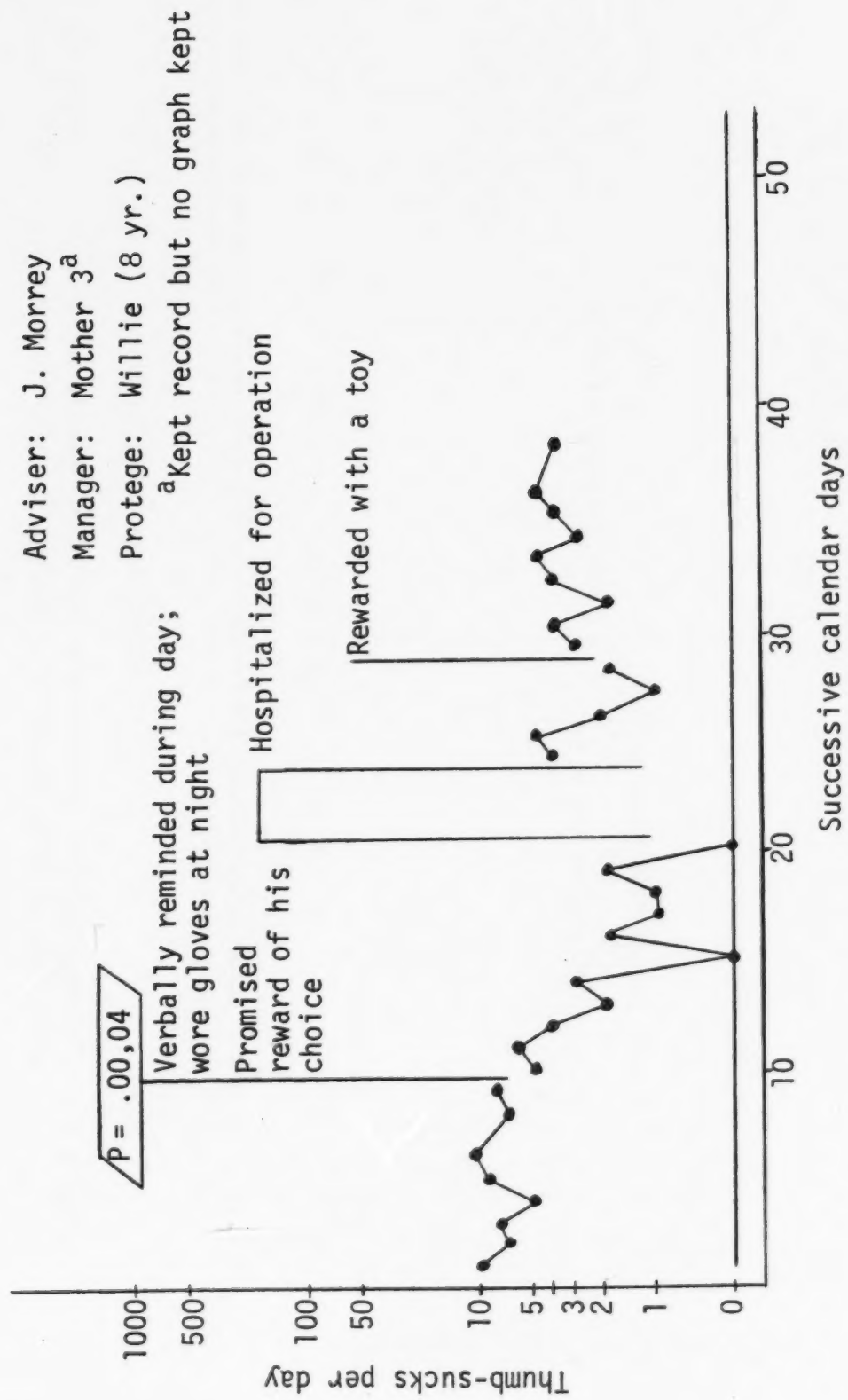


Figure 7. Thumb-sucking decreases with reminding and promised reward, but returns to about 50 percent after reward is realized.

Drew (third)

Figure 8 shows the frequency of whining and teasing (to go somewhere) that Drew exhibited. The median rate during baseline was 13 times per day. Following baseline, the mother systematically reinforced Drew for not whining or teasing. She used primarily social reinforcers (praise for not whining), but would occasionally pair this with a piece of candy or other treat.

Drew's behavior began to change almost immediately, and continued to show a steady deceleration of rate. This change is one of low probability by chance ($P = .00,11$). In the mother's own words: ". . . The problem is not entirely solved. It helps very much, however, to reward him often for refraining from whining and bothering others. We keep at it--it takes longer than with the normal child." While this latter comment may be true, the graph indicates that this behavior is rapidly coming under control.

Nancy

It took about 45 days for this project to be associated with a behavior change of more than transient duration (see Figure 9). During 100-minute observation periods, the mother counted a median rate of four times that Nancy had her fingers in her mouth during a rather long baseline period. One of the first "changes" tried was to have Nancy do the counting herself, but this resulted in very little or no perceptible change in rate of behavior.

Next, Nancy was promised that she could go to the movies if she could refrain from putting her fingers in her mouth for one day. During the observation period for that day, she did not put her fingers in her mouth. However, the mother reported that she had seen Nancy with her fingers in her mouth on two other occasions during the remainder of the day. There was no opportunity to either take Nancy to the movie or to let her go by herself, so this promise was not followed up.

The family took a trip, and during this time no record was kept. The mother did report that she "constantly" had to remind Nancy to take her fingers out of her mouth. Upon their return home, recording recommenced--with Nancy's rate equal to her baseline rate. The mother said she felt that Nancy was using this behavior to "punish" her, and this also became an area of concern. In trying what turned out to be the final "change" procedure, Nancy was to count the behavior and she was given a "responsibility" talk by her mother. The rate of "fingers-in-mouth" decreased steadily from that point to the conclusion of the project, a change significant at the .0014 level.

Mother 4 (self-project)

"I have been chewing my nails for years. I have never been able to quit, but I was able to slow down a little bit once." This is how

Adviser: J. Morrey
 Manager: Mother 1
 Protege: Drew (11 yr.)

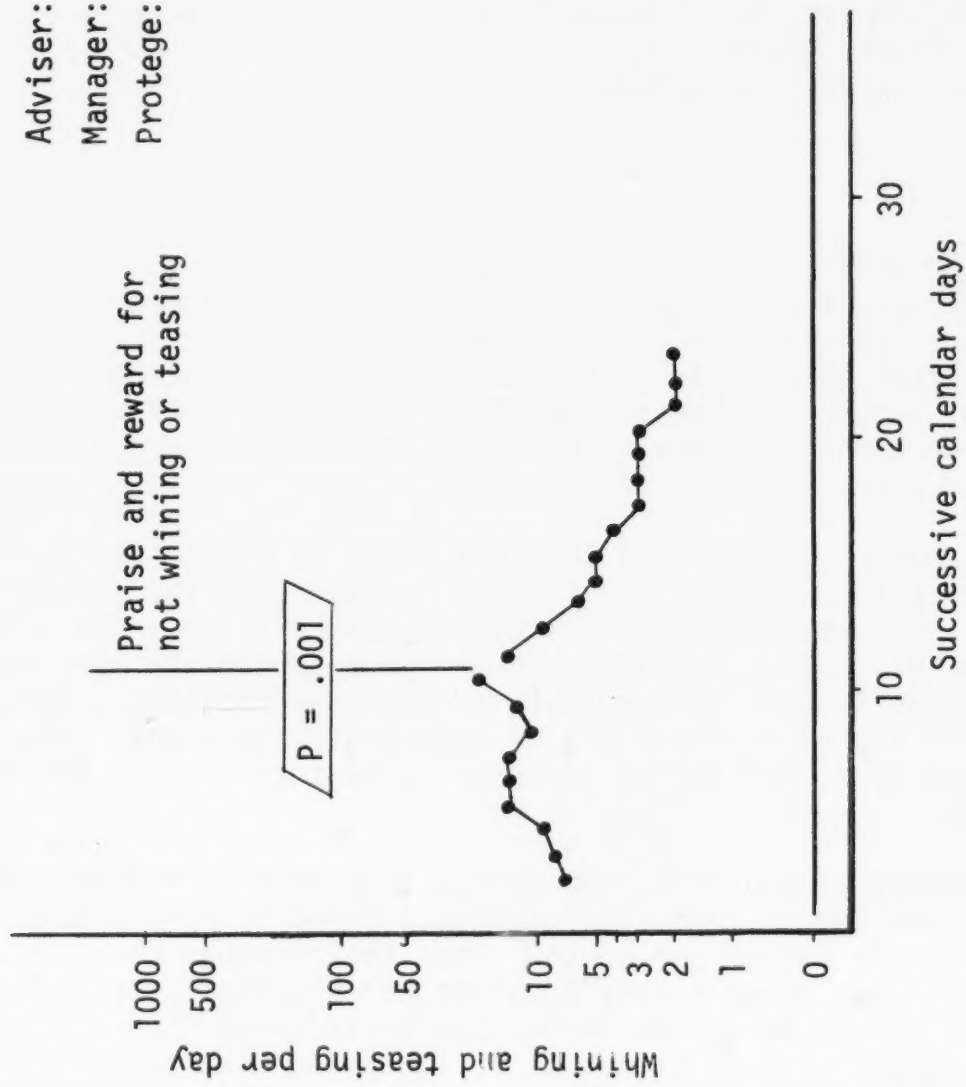


Figure 8. Whining decelerates steadily when not whining is reinforced.

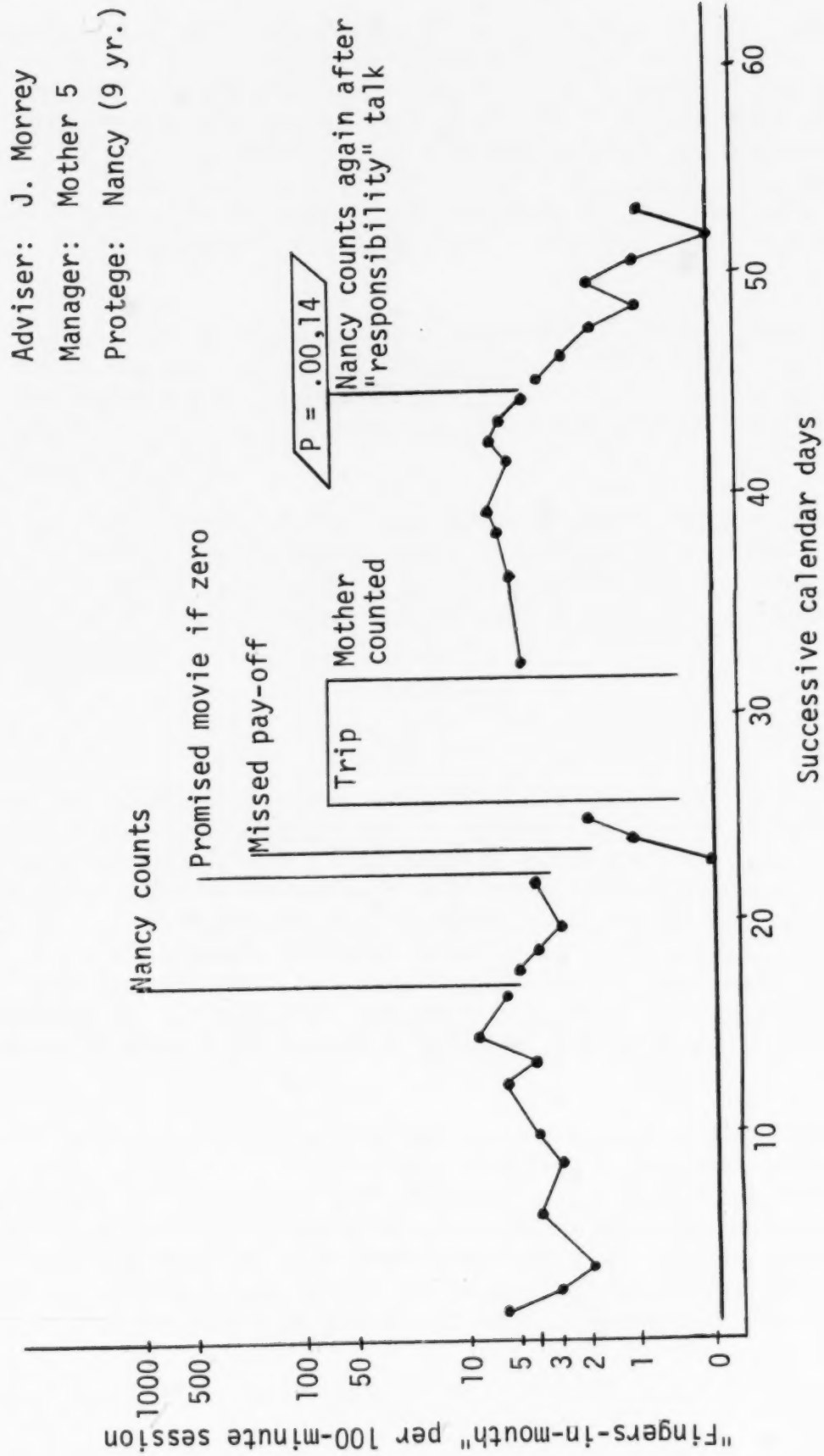


Figure 9. Obnoxious habit eludes control until self-counting and "responsibility" is stressed.

the mother described one of her own behaviors that she wanted to deal with. During baseline, she caught herself biting her fingernails at a median rate of 12 times per hour (see Figure 10).

There followed a period of time during which the mother promised herself a manicure if she could go without biting her nails for a day--an act which was as much a goal as a reinforcer, since chronic nail-biters rarely have enough fingernail left to warrant a manicure. The median rate dropped to seven times per hour during the next 17 days, with five days at zero. This change was found to be only marginally significant ($P = .07$) at this point, and was not improving further. In addition, vacation time interrupted the record for 10 days.

Just before their vacation was over, the husband promised to buy the mother a new pantsuit if she could actually stop biting her nails. Along with starting a new job, and frequent manicures, the mother was able to completely stop biting her nails, a change significant at the .007 level of confidence.

During the three weeks that followed delivery of the pantsuit, there was only one time that the mother caught herself biting her nails. This represents a therapeutic change in behavior, which occurred quite rapidly when contrasted to the years of failure to control it.

Mother 5 (self-project)

Although this project lacks baseline data against which to compare subsequent performance, it is of interest. The mother had pinpointed her own behavior target as "negative statements." She was anxious to change immediately, and wore the wrist-type counter in an effort to be aware of and control the negative statements from the beginning. During the first recording period, the mother made negative statements at a median rate of .03 times per minute (see Figure 11), even though she was attempting to reduce the incidence from the very start. In different terms, this indicates that the behavior occurred at a rate of once every 35 minutes.

A small improvement occurred during the second period of time, but the change was shortlived and not highly significant ($P = .07$). The median rate for this period of time, however, had decreased to the point where negative comments were occurring only once every 50 minutes. This was some improvement, but it must be remembered that this graph does not give enough information for interpreting either the behavior or the change in its rate of occurrence, since there was no baseline information collected.

Gary

Other members of Gary's family were the recipients of what the mother called "teasing." This was the first behavior the mother selected

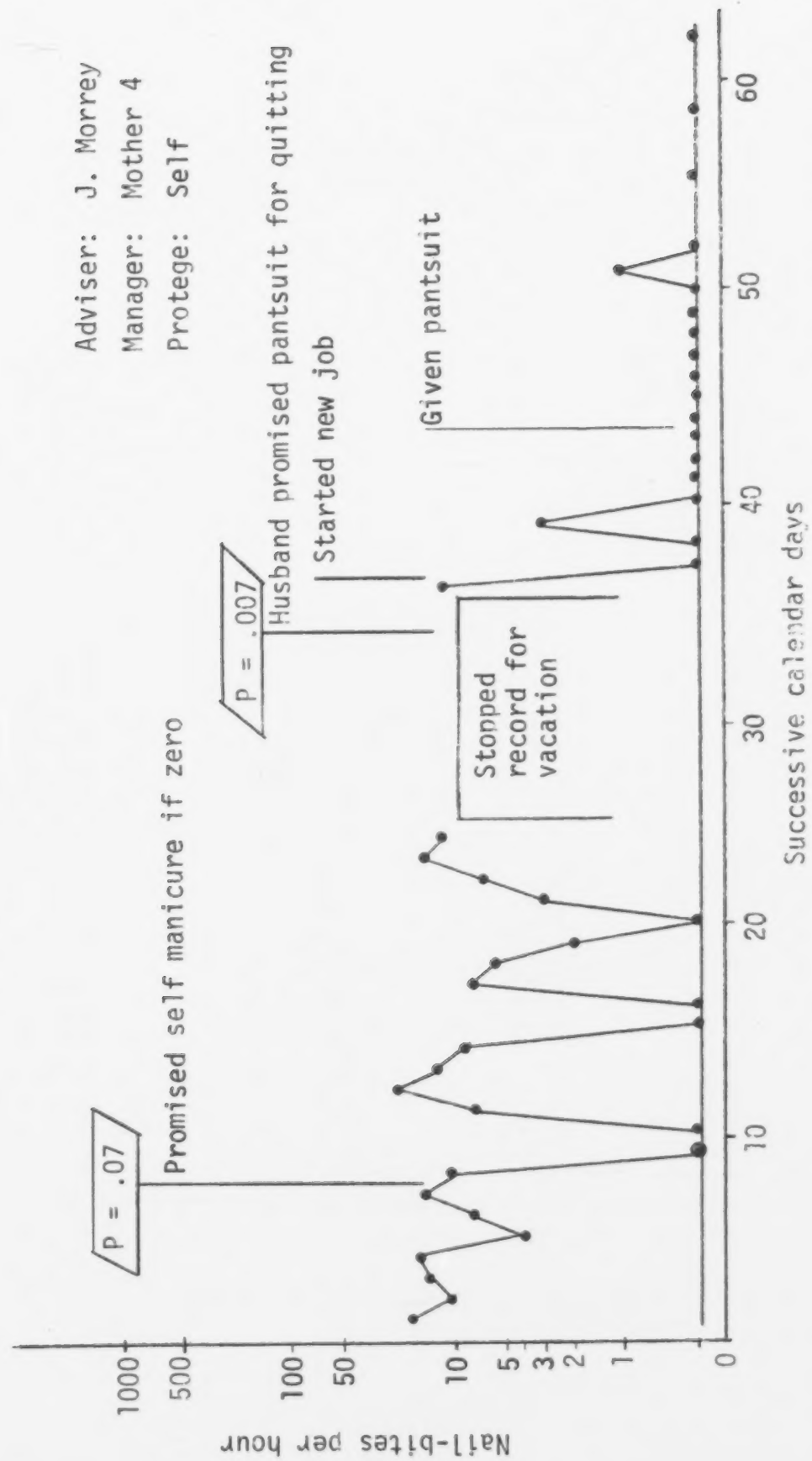


Figure 10. A long-standing habit is reduced by attention and eliminated with incentive, concurrent with starting a new job.

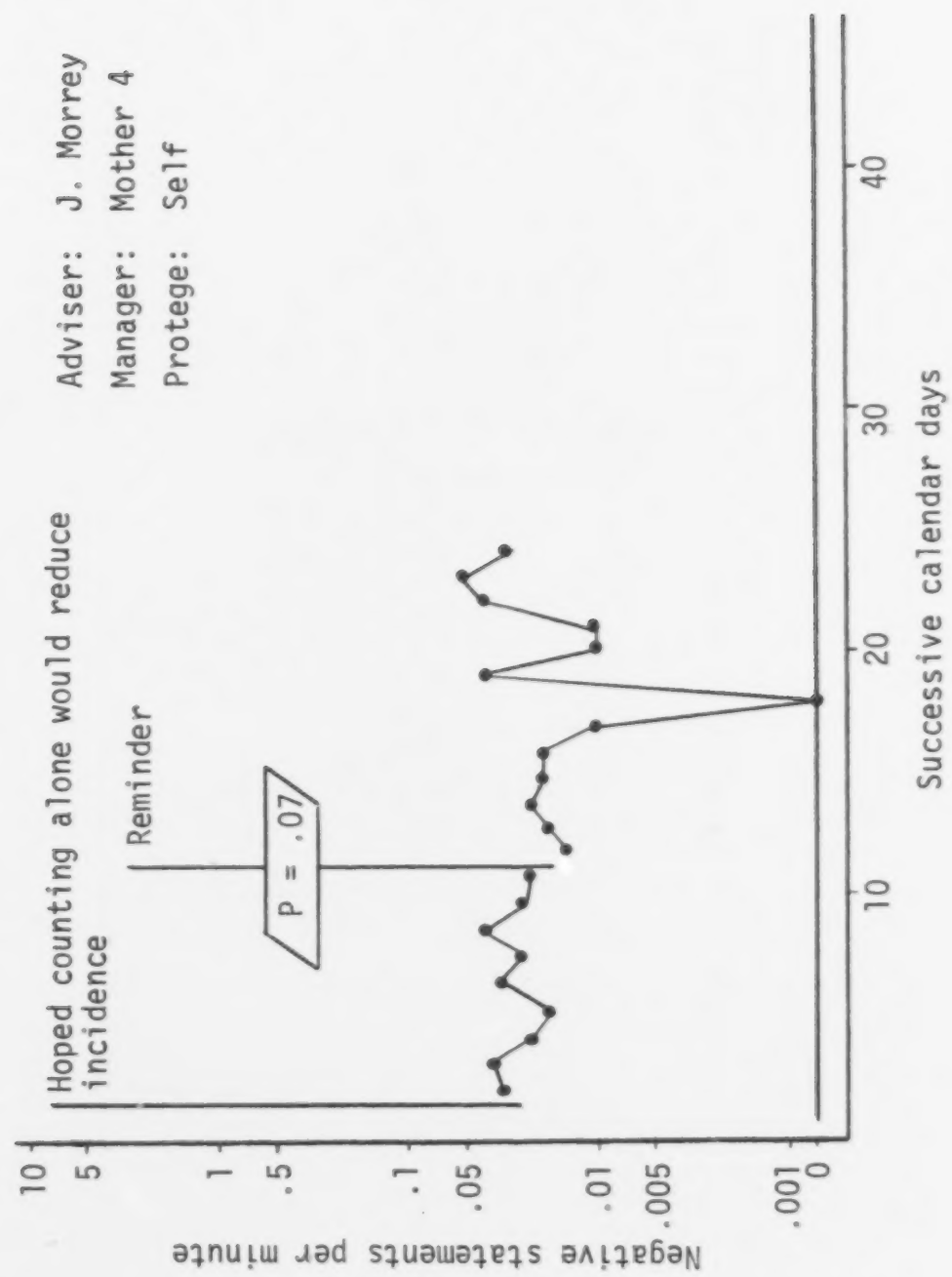


Figure 11. Without baseline data, mother was still able to reduce incidence of negative statements slightly with only a reminder.

as a target for change, and she started out by telling Gary about counting and recording. For three days, there was no teasing--but the fourth day produced a fairly high incidence of teasing. It was at this point that the drug Ritalin was no longer given to Gary, and his teasing occurred at a median rate of four times per hundred minutes during the next charted period of time (see Figure 12).

The mother stated that she felt like the Ritalin was necessary in order for him to be able to control his teasing. In spite of this, a change was planned and executed which consisted of diverting his attention whenever teasing began or whenever it appeared it might begin. This approach was associated with some minimal improvement in Gary's behavior, but the high probability value ($P = .12$), as well as the graph, shows very little desirable effect. This mother's plans for continuing to work with this behavior indicate that she understood the procedures and rationale of precise behavior management. The mother reported that she planned to reinstate Ritalin and observe the concurrent effects on Gary's teasing behavior. Later, if there had been no significant improvement, the mother wanted to try giving praise, diverting attention, and any other environmental arrangement that she might devise in a continued effort to bring this behavior under control.

Projects without graphs

Parents reported six projects which were not graphed. Three of these projects were of such short duration and so rapid in their behavioral changes that graphic representation and interpretation was virtually impossible. For this reason, there is no statistical evaluation. The first of these three projects was the first reported behavior change, reported on page 25.

Kimberly. Kim was a seven-year-old girl who was visiting the family of one of the mothers in the group. She tattled on Daniel, who in turn reinforced Kim by paying a lot of attention to her when she engaged in this behavior. The mother explained to Daniel that the best way to keep Kim from tattling was to ignore the behavior, rather than pay attention to it. Kim persisted, however, as frequently happens, since extinction procedures rarely have immediate effects.

The mother, in setting up a PBM program to establish contingencies and control the behavior, reported her procedure as follows:

I told her, when she came to stay for two days, that if she disciplined herself and kept her tattles under two or three times a day, she could have a string of pearls and some rocks of mine (Apache tears and Mexican lace agate) which she really wanted."

In the process of keeping track of tattles, the mother posted a chart on the wall and labeled it "tattles." Kim would pass this chart quite often during the day, and would often "catch" herself starting to

Adviser: J. Morrey
 Manager: Mother 5
 Protege: Gary (8 yr.)

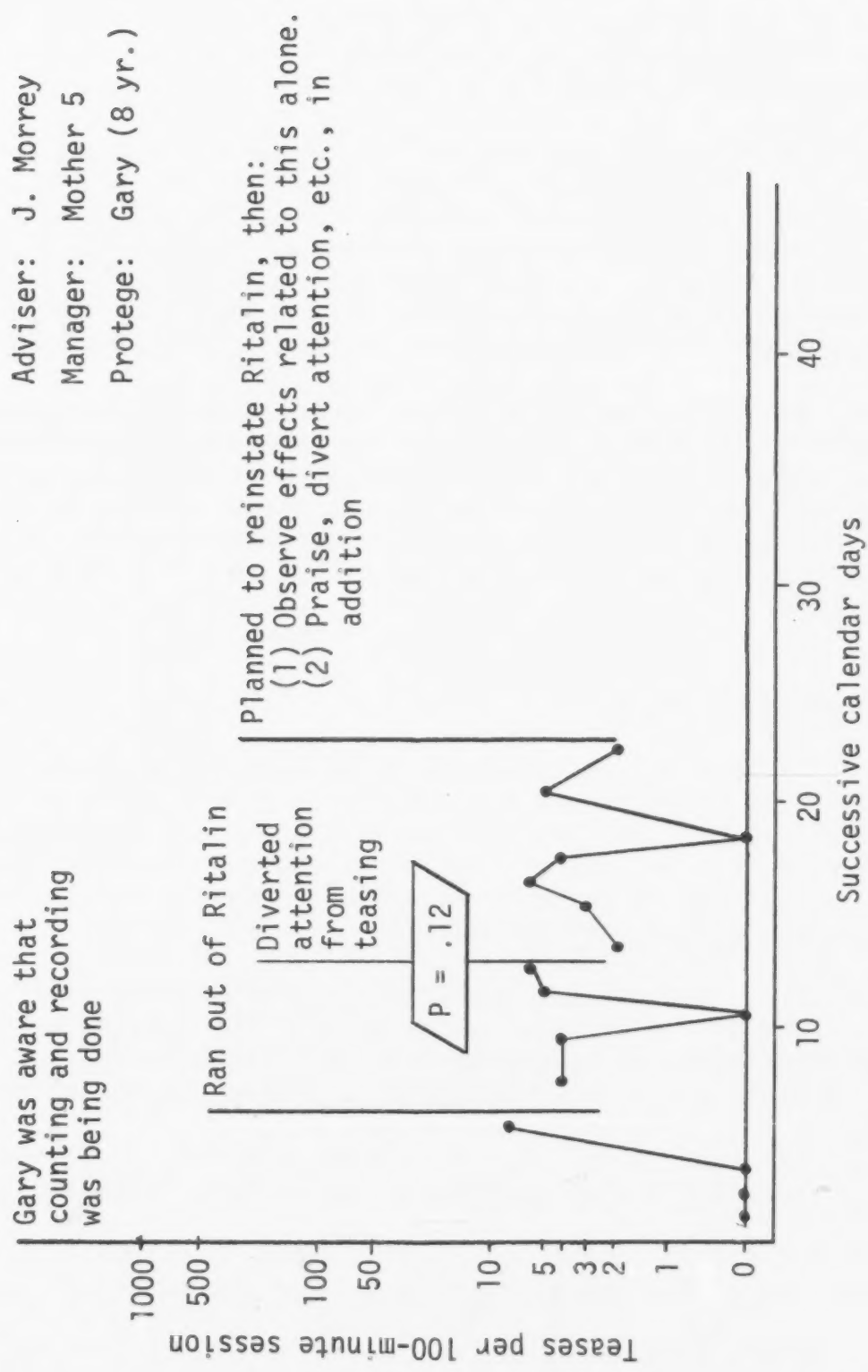


Figure 12. Lack of drugs seems to be associated with increases in unwanted behavior, but some control is demonstrated even in the absence of drugs (Ritalin).

tattle and then stop. She kept the tattling (and subsequent quarreling) incidents down to three during the two-day period. This was an immediate success, and the behavior ceased to be a problem.

Clay. Clay is Kim's three-year-old brother, and was visiting with the same family for a few days. The behavior management of mother 1 is best described in her own words:

Clay is an extremely curious and active boy. He is most affectionate and uninhibited--and delightful--but he gets into things, sometimes knocking them down, breaking something. He usually climbed up on the hearth and pulled the fireplace screen over on himself twice a visit. I had completed a large twisted stump with many roots sticking out; it was in the rock garden, shellacked and had two china birds glued on it. I took him and showed him how to stroke the twisted, glazed wood but told him that if he did not touch the birds I would give him a very nice present. He went to the wood but never touched it in two days. Ordinarily he would have pulled the birds off in the first ten minutes. This was another immediate success.

Three other projects were of long enough duration that they could have been graphed, but were not. Each produced a desirable behavior change, according to parental report. These three projects are briefly reported below:

Sherry (second). Two of the three girls in the family were able to keep their daily chores current and were assured that they would receive an allowance at the end of the week for doing so. Sherry (the retarded daughter) did not get her chores done promptly, however, and this often added to family problems in that the mother would prompt her and remind her and often over-react in order to get Sherry to do her household chores at all. The PBM concept of "little steps for little feet" was presented at subsequent parent meetings, along with the explanation that immediate reinforcement was often required if behavior was to be changed. The mother then figured Sherry's allowance in terms of the amount that would be earned by the individual chores (10 cents) and then gave her a dime immediately after Sherry finished a chore. The mother reported that Sherry now does all of her chores, and does them on time and without any prodding. This change was "nearly" immediate, and the mother is continuing the program.

Julia (second). This mother recorded, in an earlier self-project, the number of negative comments she made. She was also consciously attempting to increase the number of positive comments during the same time period. The mother reported that she would often either change what might have been a negative comment into a positive one, or attempt to find something about which a positive comment could be made. She would do this whenever she caught herself about to make a negative statement. By her own report, she is "much better" now, and believes that everyone in the family is becoming more appreciative as a result of her behavior change.

Compilation of results

The specific precise behavior management projects which were completed and reported by the parents in this study are summarized in the two tables which follow. Table 2 reports capsule summaries of nine behavior change projects significant at or beyond the .001 level. The complete information on each project, including the graph and explanatory narrative, is reported in the preceding section.

Table 3 reports the behavior management projects that were either: (1) only marginally significant; or (2) not amenable to statistical evaluation. Complete information on each of these is also available in the preceding section.

Each column in the following two tables contributed information pertaining to the questions that were posed at the beginning of this study. Column A (in both tables) shows that precise behavior management projects were attempted with 12 different proteges in 18 projects. Six parents (representing five families) participated successfully. The family in which the protege belongs is numbered in column B.

The wide variety of behaviors selected as targets for modification or management are listed in column C. Columns D and E pertain to the direction of change in rate of behavior for each project and whether or not the obtained change corresponds with the desired direction of change. In behavior management projects using rate data, the status of the behavior over time is the important datum. The static and root word "celeration" (L. celerare: to hasten) was selected for categorizing both the dynamic properties of increasing the amount of behavior over time (Acceleration) and decreasing the amount of behavior over time (Deceleration).

Many different environmental changes and manipulations were made by the parents in the process of conducting their individual precise behavior management projects, and these are listed briefly in column F. It is important to know whether these changes are implemented because: (1) they were suggested in class; or (2) they represented attempts by the manager to manipulate the environment based on classroom information; but either individualized for the protege in question or creatively applied specifically in a particular situation (which was one of the goals). This information is tabulated in columns G and H.

The probability that the behavior change occurring in each precise behavior management project is not produced by chance alone is presented in column I and has been determined by applying Ogden Lindsley's Mid-Median Adaptation of Fisher's Exact Probability Test of Significance to the observed behavioral changes.

It is important to produce changes in behavior, but it is only worthwhile if these changes persist over a period of time. Wherever possible, records were continued in an effort to assess the degree of lasting change that has been produced. The duration of this study limits any long-term interpretations in this regard, but the short-term follow-up information is presented in column J.

Table 2. Compilation of pertinent points in nine highly significant behavior change projects

A	B	C	D	E	F	G		H	I	J
						Idea for change came from	Class			
Protege	Family number	Movement	Celeration		Change			Self	Probability	Follow-up of behavior change
			Target	Actual						
Sherry (first)	2	Playing messes left	De	De	1)"Sunday Box" 2)Doll dress reward	X		X	.00,000,04	Maintained near zero
Drew (first)	1	Being negative	De	De	1)Daniel counted 2)Time-out 3)Dan to quit reinforcing			X X X	.00,000,05	Maintained low
Ethel	1	Failing to show appreciation	De	De	Told co-workers			X	.00,002	Maintained near zero
Willie (first)	3	Leaving without asking	De	De	1)Praise 2)M&M's	X		X	.00,003	Maintained at zero
Randy	4	Hitting slot	De	De	1)Paper money 2)Smaller steps of time	X		X	.00,03	Maintained near zero
Willie (second)	3	Returning tardily	De	De	1)Praise 2)M&M's				.00,02	Maintained at zero
Willie (third)	3	Thumb-sucking	De	De	1)Verbal reminder 2)Night gloves 3)Reward of choice	X		X	.00,04	Returned to 50% of baseline
Drew (second)	1	Whining and teasing	De	De	1)Praise 2)Reward	X		X	.00,1	Steadily decreasing
Nancy	5	Fingers in mouth	De	De	1)Self-counting 2)Movie if zero 3)"Responsibility"	X X		X	.00,4	Steadily decreasing

Table 3. Compilation of pertinent points in nine behavior management projects which were not amenable to statistical treatment or which were only marginally significant

A	B	C	D		E	F	G		I	J
			Target	Celeration Actual			Class	Idea for change came from Self		
Protege	Family number	Movement				Change			Probability	Follow-up of behavior change
Pat	4	Nail bites	De	De	De	1)Manicure 2)Pantsuit	X	X	.00,7	Maintained at zero
Julia (first)	5	Negative comments	De	De	De	1)Counting alone 2)Reminder	X	X	.07	Returned to baseline
Gary	5	Teases	De	De	De	1)Told of counting 2)Divert attention	X	X	.12	No inform- ation
Julia (second)	5	Positive comments	Ac	Ac	Ac	Counting alone	X		Not amenable	No inform- ation
Sherry (second)	2	Prompt chores	Ac	Ac	Ac	Immediate 10¢		X	Not amenable	Continues good
Kimberly	1 (Visit)	Tattles	De	De	De	Could have pearls & rocks if below floor of 2-3		X	Not amenable	No inform- ation
Clay	1 (Visit)	Breaking things	De	De	De	1)Demonstrated caution 2)Promised reward		X	Not amenable	Immediate zero
Willie (fourth)	3	"Mind- changing"	De	De	De	Counting only	X		Not amenable	Immediate zero

These tables will frequently be referred to in the subsequent discussion of results.

Question 1

The first question asked in this study was: "Will parents be able to learn and implement a precise behavior management approach to behavior modification and management of their child at home?"

This approach to parent-child relationships and behavior management was adjudged highly successful with those parents who stayed with the program. The six participating parents produced 17 behavior change projects, with six of these showing dramatic and rapid changes in behavior. Of these 17 projects, nine were statistically evaluated and were significant at or beyond the .001 level of confidence (the level of acceptance). Three were only marginally significant (.007, .07, and .12, respectively) and five were not amenable to statistical interpretation. All parents were able to conduct their projects using a majority of the precision teaching principles that were presented. They were able to work effectively with their own behaviors as well as those of their children. The Precise Behavior Management approach was used in working with a wide variety of behaviors (see Tables 2 and 3) with 94.4 percent success. Most of the changes produced were lasting, at least for the short-term followup period permitted. Question 1 can, therefore, be answered in the affirmative, since behaviors were changed and because the extent and speed of these changes were evident, observable, recorded, and statistically evaluated.

One aspect of precision teaching proved to be troublesome to some of the parents, however, as 40 percent were unable to understand and effectively use the six-cycle, 140-day graph. An additional 40 percent reported having considerable difficulty with it, but were able to overcome the problems and use the graph accurately and as they were intended.

Question 2

The second question was concerned with the significance of the behavioral changes obtained, and whether these changes were accelerative or decelerative as desired. Tables 2 and 3 provide the information necessary to answer this question. In column I of both tables the following information can be seen: of the 12 projects which could be statistically evaluated, all but three were found to be significant at or beyond the .001 level of confidence and all but two showed striking graphic changes in frequency of occurrence of the target behavior. The three projects (shown at the top of Table 3) which did not reach the above level of significance had exact probability values of .007, .07, and .12, with the latter two being only marginally significant. The five remaining projects were not amenable to statistical interpretation, but the graphs show rapid changes and continued behavioral control.

The D columns show the desired directions for change that were the target in each project, and column E tells the direction in which the change actually occurred. In every case, the target and realized change correspond with each other.

It is clear that parents can and do control both the direction of change and the amount of behavior emitted. There were only two cases where behavior did not change with good significance (Gary and Julia, first), and the change was in the desired direction in every project. A majority of the projects had extremely low probability figures and the change was lasting in most cases (column J). Question 2 can thus be answered, yes.

Question 3

"Will the parent be able to exercise more self and situational control as precise recording and behavior monitoring proceeds?" is answerable by: (1) interpreting the results of the individual behavior projects as compiled in Tables 2 and 3; and (2) by examining parent comments.

Self control is reflected in several of the projects. The projects dealing with the behaviors of the parents themselves (Ethel, Pat, Julia) demonstrated self-control in that behavior changed in every case! In every case, the mothers reacted to behaviors consistently, and in reinforcing behaviors, this was also evident. Consistency was better in some cases than in others, to be sure; but consistency of procedures and practices over time reflect self-control as well as situational control. Situational control is also indicated by the observation that every behavior change was in the desired direction. This information suggests that a PBM training course for parents is empirically beneficial to both parents and children and this beneficial result can be achieved in a relatively short period of time. In answer to question 3, the data indicate that parents are able to exercise more self and situational control as they learn more about PBM.

The following quote, taken from a tape of the tenth and final session, has implications for question 4, as well as for question 3. It illustrates that this parent: (1) did not exercise self and situational control always; and (2) that she was aware, at least, that it was lacking in this case. She said:

. . . I tried praising them for the things they did right. But this morning it was pretty hard when Mark dumped three gallons of milk on the front step. I'm afraid I wasn't that good--I said "I needed help and spent a long time getting you to come and help me, and then you dump the milk out and make another mess!" I about swatted him!

Question 4

The fourth question posed was: "Can parents learn to view behavior in terms of the environmental conditions that cause and maintain it, thus coming to react less from emotion or intuition and more from reliance on systematic and objective behavioral change methods?" It was one of the unstated goals of this training program to stimulate just such a change in parental behavior and attitudes. It was achieved with those parents who continued in participation as rated by the variety and success of the behavior control tactics they employed.

In column F of Tables 2 and 3, a wide variety of environmental change tactics is listed. Each was used in a behavior management project, and was applied as a result of a specific tactic being presented in class (column G) or it was an application of PBM concepts tailored individually, either for the protege in question or for a particular situation (column H).

Since virtually all of the environmental change tactics employed were selected because of their possible effective relationship to the target behavior, it can be said that the parents were indeed viewing behavior in terms of the environmental conditions that cause and maintain it. This is supported by the fact that 20 to 32 change tactics were products of the parents' individual application of PBM principles, often creatively selected and employed.

Nearly two-thirds of the behavior change tactics were selected and applied by the managing parent independently (column H). There was a definite trend toward increased selection and individualization of tactics independently after an initial reliance on classroom-suggested tactics. This finding also supports a "yes" answer to question 4.

The number of records maintained and the steady increase in records begun while the class proceeded indicate that the parents came to rely on systematic and objective behavioral change methods. Keeping records and counting behavior also forced rational reaction to behaviors, since it was the frequency of occurrence that was systematically being worked with. This also avoided over-reacting or reacting emotionally to the occurrence of a particular behavior.

On the basis of the foregoing information, it can be stated that parents do both rely on and systematically use objective environmental events in controlling behaviors.

There is still some evidence of parental reaction that is less rational than emotional, however, as in the following quote:

. . . I tried praising them for the things they did right. But this morning it was pretty hard when Mark dumped three gallons of milk on the front step. I'm afraid I wasn't that good--I said "I needed help and spent a long time getting you to come and help me, and then you dump the milk out and make another mess!" I about swatted him!

This parent's attention is directed toward being more positive, since she recalls and talks about it. This alone may help her to have less of a problem as she continues her efforts to become more positive.

Form usage

Even though there are no conclusive data to support it, there is evidence to suggest that the 6-cycle, 140-day semilogarithmic graphs employed in this study were more detrimental than additive in their function. The most frequent procedural questions to arise throughout the program revolved around the proper procedures for the correct use of this graph. None of the parents were able to record performance rate data on the graph precisely and correctly. Every graph required some changes and replotting (based on original rate data collection sheets) prior to inclusion and publication. In addition, 40 percent of the parents who both completed the program and experienced success in behavior modification did not use the graph at all. They, in fact, stated that they could not understand it. On the basis of this (and other comments), it is the opinion of this writer that one possible reason for a fairly high attrition rate was the early distribution, explanation, and employment of the 6-cycle, 140-day behavior graph. Recommendations based on these findings are included in the following chapter.

One finding, however, that argues strongly in favor of PBM, and especially of precise record keeping, is that each parent became most enthusiastic as changes in behavior of their child (or their own) became observable--either on the graph or on the data collection sheets. Traditionally, changes in problem behavior had not been observable to parents until the behavior had disappeared entirely, and for a considerable length of time. Since this is true, and since behavior is rarely eliminated or acquired without much effort and the passage of some time, it is easy to understand why parents (and teachers in the school setting) become discouraged when working with any child, and especially so with mentally retarded children. The tools of precise behavior management give accurate measurement and show even the smallest progress as soon as it is made. Several benefits derive as a direct result of this. Reinforcement can be programmed and delivered at appropriate times. More accurate information is used as a basis for parental action. Parents become encouraged to work harder and more systematically with their retarded children. A point of major importance in this connection is that parents are themselves reinforced for working with their children in that: (1) behavior changes can be seen immediately; and (2) frustration and emotional reaction can be replaced by a certain amount of objectivity and confidence (and hence, the additional positive reinforcement of escape from frustration and negative reactivity).

Behavior targets

During the first 10 minutes of the first meeting, each parent was requested to complete a "behavioral information" form (see Appendix B).

The descriptions used to describe or "pinpoint" problem behavior at this time were generally clear and did not differ qualitatively with respect to whether or not the parent had been previously introduced to learning and behavioral principles. Though the behaviors were stated clearly, only 30 percent were well pinpointed (+) (identified singly and precisely), as the following random samples show:

Slapping and banging his head (hard).+
Not wanting to do things when asked.
Putting things in his mouth.+
Unable to sit quietly--attention span.
Talk.
He talks continually.
Possessiveness to mother.
Learning to mind without (parents) having to get angry.
Refusal to do things that are always to be done, wash hands, etc.
Dawdling after asked to do something.+
Immature behavior.
Stutters.+
Talks back.+
Dishonesty.

Parents were also able to precisely pinpoint their own target behaviors (+) only 30 percent of the time during the initial meeting. They also listed many fewer behaviors as being targets for change. Some samples of parent listings of their own behavior include:

Develop more understanding for all children.
Does not understand child behavior.
Speaking affirmatively.+
Run out of patience with persistent misbehavior.
Nagging.+
Have more patience.
Avoid being overprotective.

Parents were again asked to complete this same form during the last session. The descriptions of target behaviors given in this post-session listing was adjudged to be much more precise by the investigators. Eighty to 100 percent of behaviors listed by these parents were well pinpointed for action (+).

Child behaviors.

Concentrate for longer periods of time.+
Stop sucking thumb.+
Teasing.+
Fingers in mouth.+
Whining.+

Adult behaviors.

Praise more.+
Have more patience.
Make positive statements.+
Smile more.+
Show appreciation.+

Parents who had filled out the pre-session form but who did not attend any meetings after the first night were contacted by letter (see Appendix) and asked to fill out the same form as persons who completed the program. Their behavior listings reflected a similar degree of impreciseness as was observable in their first attempts (30 percent adequately pinpointed). Random samples include:

Child behaviors.

Not wanting to do things when asked.
Will not mind mother.
Balking when asked to do something.+

Adult behaviors.

Thinking out answers so as to reason problems out first.
Ignoring him and hoping he will get over it.
Have more patience.

General results and discussion

First: it has been the investigators' experience that students and teachers who are being instructed in the use of PBM techniques want some rather concrete suggestions and expect certain behavioral "recipes" to be forthcoming. The parents in this program had the same expectations, especially early in the study. Constantly stressing the individuality of each protege and his problem behavior decreased the tendency to look for recipes and increased the ability to tailor a program for a specific person.

Second: the major problem encountered during this parent program was not one of convincing the parents, or even one of effecting changes in behavior. It was, rather, the difficulty found in motivating parents to continue with the course of instruction. Most parents who dropped out did so for concrete reasons, but it is necessary to find times or conditions which will contribute to increased parental participation. Several factors must be investigated to increase future attempts to train parent groups.

Third: at the inception of the project, it seemed to be a good idea to ask each parent to write a short narrative regarding the problem behaviors dealt with, the changes tried, and the results associated with each project. This narrative was written to criteria by only

one parent. This narrative appears in Appendix C in its complete form and is edited only with respect to spelling and punctuation.

There were not enough data for analysis of these narratives in any form. This suggests that this is one task which parents either will not or cannot do without much additional effort. Hindsight indicates that it was not realistic to request this behavioral change narrative in written form.

Fourth: mothers reported that they felt that they were reacting in a much more "human" way towards everyone with whom they came in contact. It was a general feeling among the parents who participated throughout the program that they understood other people (including their children) far better than they had prior to this time.

IMPLICATIONS

Historically, parent counseling seems to have been based on the theoretically naive premise that adults (especially parents) are, or should be, able to change their behavior at will. Subsequent research and some knowledge of social learning theory show the degree of such naivety. Since some parent counseling assumes this same premise today, it may be said that sophistication in working effectively with parents is lacking. Bandura (1969, p. 78) points out: "Many well-meaning people who subscribe to these mental hygiene practices, which have been widely promulgated over the years, may at times inadvertently support or even increase the very problems their earnest efforts are designed to ameliorate."

Since problem behavior often leads to diagnosis, which in turn leads to treatment (Bijou, 1968), intervention for the purpose of changing problem behaviors is obviously needed. The question is, who is to provide it? And the answer is related to another question: "Who has most opportunities to provide it?"--obviously, the parents. But parents cannot do things they are not equipped to do. Their behavior needs to be shaped to the point where they have the tools, the abilities to "exercise control over the very conditions that regulate the behavior" of their children (Bandura, 1969, p. 105). This would indicate that parents should be trained to provide management of the child and his behavior first, and intervention if and when it becomes indicated. The task of equipping parents with procedures, tactics, and understanding of the behaviors their child exhibits which contribute to his "exceptional" label is one of parent training in the light of modern research, social learning theory, and behavior modification.

Once parents have been thus reoriented, they can be a very influential force in completing school efforts in child education because they are better equipped to understand the problems and procedures of teachers. Parents who use PBM can be expected to take a greater interest in the education of their child and in the educational process--especially if the teacher is likewise trained. When parents are trained in the use of PBM and when they take a greater interest in the educative process, parents can provide continuity between the school setting and the home.

Parents can be an influential force with both school administration and teacher selection. Once parents begin to see the potential effectiveness of PBM in the learning and behavior of their child, they can begin to exert pressures for better teacher-training programs. The incidence of ineffective behavior management usually found both at home and at school (Bandura, 1969) could thus be reduced. Since it is possible to institute an effective parent training program with volunteer parents, this would suggest that the approach would be

applicable to parents in general. Another implication in this same vein is that development of pre-parent training programs for young adults in high school and college programs may be productive of improved child management abilities if provided prior to marriage.

Parents who are trained, and thus have some knowledge of behavior modification principles and practices, can avoid problems in child rearing and can produce positive results in the process of working with their children. This further implies that parents can manage and change child behaviors before they become a problem in other settings; they can supply the most consistent and concentrated therapy available and intellectual development can be facilitated if Hunt's (1961) theorizing about intelligence and experience is correct; guilt, self-blame, frustration, and rejection can be avoided; and systematic, consistent, and positive behavior management programs can be implemented. As Sidney Bijou (1968) has stated: "Avoidant, abbreviated and dutiful social relationships deprive any child, physically impaired or not, of the basic intellectual and social interactions that only people can provide." The overall implication is that this can be avoided by systematically training the parents in precise behavior management.

With respect to the school, parent training in PBM can increase the educability of mentally retarded students by stimulating their environment to be more consistent and to provide attainable goals, as well as reinforcing the attainment of such goals. It would provide teachers with a way of working more closely with the parents; and if these things can be realized, educational programs designed for an individual retarded child can have intensified impact due to increases in continuity between the home and the school environments. Behavior problems in the school can be expected to decrease in both intensity and frequency as the parents improve in their consistency and behavior management abilities.

All of these things point out how very badly parent training is needed. However, parent involvement is not enough, nor is therapy with the parent or the family (Bitter, 1964; Levitt, 1963). What *is* needed is systematic parent training aimed at behavioral understanding and designed to improve the consistent, efficient, and proper use of behavior management principles said to be generally inadequate by Bandura (1969). If parents can be trained to use behavior management principles properly, consistently, and efficiently--as this study indicates they can--the efforts of the school, those of the parents, and productive behavior of children will all be benefited.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This research was designed to explore the effects on parents and children of training parents in the use and application of a behavior management system relying on rate data and charted behavioral observation. The main areas of specific interest were: (1) whether or not parents were able to learn and implement a precise behavior management approach to behavior modification and management of their child at home; and (2) whether or not parents can achieve significant accelerative or decelerative changes in the behavior of their individual proteges in the direction desired.

The rationale for the study was that training programs are most effective when attention is given to the child and his environment--especially the home environment, including the parents. Programs dealing with handicapped children should especially be concerned with the total environment of the individual child.

The subjects were interested parents of either educable or trainable retarded students in Logan and Cache County, Utah. Six parents became participants on a voluntary basis. They were introduced to behavior management in 10 weekly training sessions which were designed to both inform and provide practical, supervised experience with the process of precision teaching as an approach to behavior management.

Of the six parents who tried behavior management projects, all experienced success. Every parent had more than one project, and one parent completed six different projects during the 10-week period. Altogether, 17 specific projects were reported by the six participating parents. Sixteen of these projects were successful in producing changed behavior. All changes were in the desired direction. Only one project was not reliably associated with any significant change in behavior.

Of the 17 projects, nine produced behavior changes which were significant at or beyond the .001 level of confidence. Three were significant at the .007, .07, and the .12 levels, respectively; and five were not amenable to statistical evaluation, even though each behavior changed rapidly and dramatically.

The results of the parents' attempts at behavior management show that parents were able to learn and implement a precise behavior management approach to behavior modification and management of their child at home. The second area of concern was also answerable in the affirmative, since all but one of the behavior management projects that the parents attempted were associated with behavior change in the

direction initially desired; and a majority of the projects were statistically evaluated and found to be significant at or beyond the .001 level of confidence. Changes in attitudes and child-rearing practices of the parents were also realized.

Many more parents started the program than continued with it. Withdrawing from the program was associated primarily with seasonal influences. There was considerable enthusiasm for the program shown by those who had been able to attend only one or two sessions.

As a result of this parent training program, the following recommendations are made:

1. Parents should be instructed in the use of a precise behavior management system relying on rate data and charted behavioral observation.
2. The forms used in collecting and charting behavioral information should be simple and easily understood by the parents, as well as adaptable to a wide variety of situations.
3. Graphs should be used and are very productive of parent enthusiasm.

Conclusions

As a result of this study, conclusions were made regarding parent training, program implementation, program effectiveness, procedural effectiveness, and the effects of parent training in precise behavior management on both parents and children. The following are the specific conclusions derived from the results of this study:

1. Parents were able to learn and implement a precise behavior management system relying on rate data and charted behavioral observations.
2. Parents can significantly effect the behavior of their children and in so doing become more consistent, less emotionally reactive, and more reinforcing to their children and themselves.
3. As parents proceed with PBM training, they move from an original dependence on concrete suggestions to independence and effective planning and application of PBM programs. Parents were able to devise creative as well as effective programs for managing the behavior of their children.
4. Parents can plan and carry out programs in PBM independently because they learn to view behavior in terms of the environmental conditions that cause and maintain it.

5. Self control and situational control are both obtained and enhanced as a result of training in PBM.

6. Maintaining a precise record (charting) is one of the most helpful aspects of PBM, primarily because it allows even small changes in behavior to be observable, thereby encouraging parents to continue to work with their children. This is seen as being especially important in families where there are mentally or emotionally handicapped children present.

7. Based on reports by attending mothers, they viewed PBM as the best program they knew of for dealing with themselves and their children, as well as with other people.

8. Enthusiasm for PBM was generated in the participants and, to a lesser extent, the dropouts as well.

9. It is possible to work effectively with parents, even during times of the year when adverse attendance influences may be in operation.

Recommendations

For parent training programs in the future, the following major recommendations are made:

1. It is necessary to find ways of reducing attrition rates. In this study, as well as in some other programs that have been designed to train or to solicit the help of parents (Kraft and Chilman, 1966; Heber, 1968; Lindsley, 1969), getting and keeping parental involvement was one of the major problems. Attrition rates as high as 70 percent were reported by Lindsley. Heber obtained somewhat better participation by providing services to the parents, as well as by paying them. A study designed to find the effects of monetarily reimbursing parents for participation is reportedly under consideration in Indiana--such a study may be helpful and should be attempted. The results of this present study indicate that it is not necessary to pay parents in order to achieve enthusiasm, acceptance, or application of behavior management, but it may well prove helpful in reducing attrition.

2. This study gives some conclusive evidence that parent training can, indeed, result in changes that are beneficial for parents as well as children. These changes facilitate the production of "supportive and stimulating" home environments that can be procedurally similar to that of the school. Parents who are knowledgeable and aware are going to be more critical in their demands upon the school in terms of outcomes for their children. For these reasons, it is recommended that this (or a similar) kind of training opportunity be provided to as many parents as possible.

3. Since very few parents were able to accurately use the 6-cycle, 140-day behavior graph, and since much instruction time was used in its explanation, it is recommended that future research be conducted using a behavior graph much like that employed by Patterson and Gullion (1968) and explained in their programed text, *Living with Children*. It is suspected that the early introduction, employment, and distribution of the more complex-appearing graph contributed to the high attrition rate.

4. A simple rate data form (Appendix A) was used to record basic data, as well as was the more complex-appearing "rate computation sheet." Parents were usually able to learn to use the more complex form, but the simple form was preferred. Much less instructional time was needed for the simple form. In view of these two factors, the writer would suggest the use of the simple form in any case where time was at a premium and training was not intense, as with parents and other lay persons. The more complex form may better fit the needs of the professional or lay person when there are opportunities for adequate training.

5. Patterson and Gullion's book, *Living with Children*, which is readable and accurate, could well form the core of a parent training program when supplemented with precise behavior management techniques. Under any circumstances, this is a helpful text and is recommended for use, either to "prime" parents prior to working with them or in the course of conducting a parent training program.

6. It is recommended that parent training programs be scheduled at times when competing activities are at a low point. The reasons given for attrition in this study indicate that increased participation may be expected during the winter months, although it was possible to work effectively with parents during a time when participation was low.

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APPENDIXES

Appendix A
Letter of Invitation to Parents and
Behavior Modification Work Sheet

Dear

Each year thousands of parents seek professional advice on how to handle problems with their children. For some time now, behavioral scientists have been working to develop a method of showing parents how to encourage desirable behavior in their children and gradually eliminate undesirable behavior.

People who study behavior believe that within certain broad limits all behavior is learned. They also learn that it is just as easy for a child to learn behavior which is troublesome to parents, as it is to learn "good" behavior. This troublesome behavior often creates conflict and unhappiness for children and parents alike.

Dr. Devoe Rickert and Mr. James Morrey are making a special effort to bring a behavior management program to parents in Logan and Cache Valley. This program has been especially designed for parents of exceptional children. We believe it is possible for any parent to manage the behavior of his children, and to do this without conflict, anger or frustration.

As parents of an exceptional child you are being invited to attend a meeting to be held on May 12 at 8:00 p.m. in the Multi-Purpose Room of the Cache Training Center. At this meeting we will explain our plan and introduce you to the program. You will then be free to decide if you wish to continue. There will be no charge for the service.

We feel our program has much to offer both parents and children. We will be delighted if you will attend this meeting and become acquainted with this procedure.

Sincerely,

Devoe C. Rickert, Assistant Professor

James G. Morrey, Instructor

DEPARTMENT OF SPECIAL EDUCATION

Behavior Modification Work Sheet

ADVISOR _____ PAGE _____ of _____ PAGES

MANAGER _____

PROTEGE _____ AGE _____

ADDRESS _____ PHONE _____

[illegible]

Behavioral Information Questionnaires and
6-cycle, 140-day semilogarithmic graph

Your name

Your age

Years of formal schooling

Occupation of husband

Does wife work? _____ Occupation _____

Your child's name / Age

Phone

LIST SOME of your child's behaviors that you would like to have changed.
Be Specific, and put first things first.

1. _____
2. _____
3. _____
4. _____

1. _____
2. _____
3. _____
4. _____

Yes _____ No _____ Where? _____

M-F _____: M-F _____: M-F _____: M-F _____: M-F _____:

7⁶⁹₅

BEHAVIORAL INFORMATION

Your name (only if you don't mind)

How many Precise Behavior Management sessions did you attend? _____

Briefly, what was your reason for not continuing the course of instruction in Precise Behavior Management? (Please comment)

PROBLEM BEHAVIOR DEFINED: Too little of a desirable behavior OR too much of an undesirable behavior.

Please list, once again, some of your child's behaviors that you would like to have changed. Be specific and put first things first:

List some of your behaviors as parents that you would like to change:

We would also appreciate any comments you may have regarding that part of the program which you did attend:

Use other side if necessary

Follow-up mailed form. Data collected following conclusion of the study.



Figure 13. Six-cycle, 140-day semilogarithmic graph.

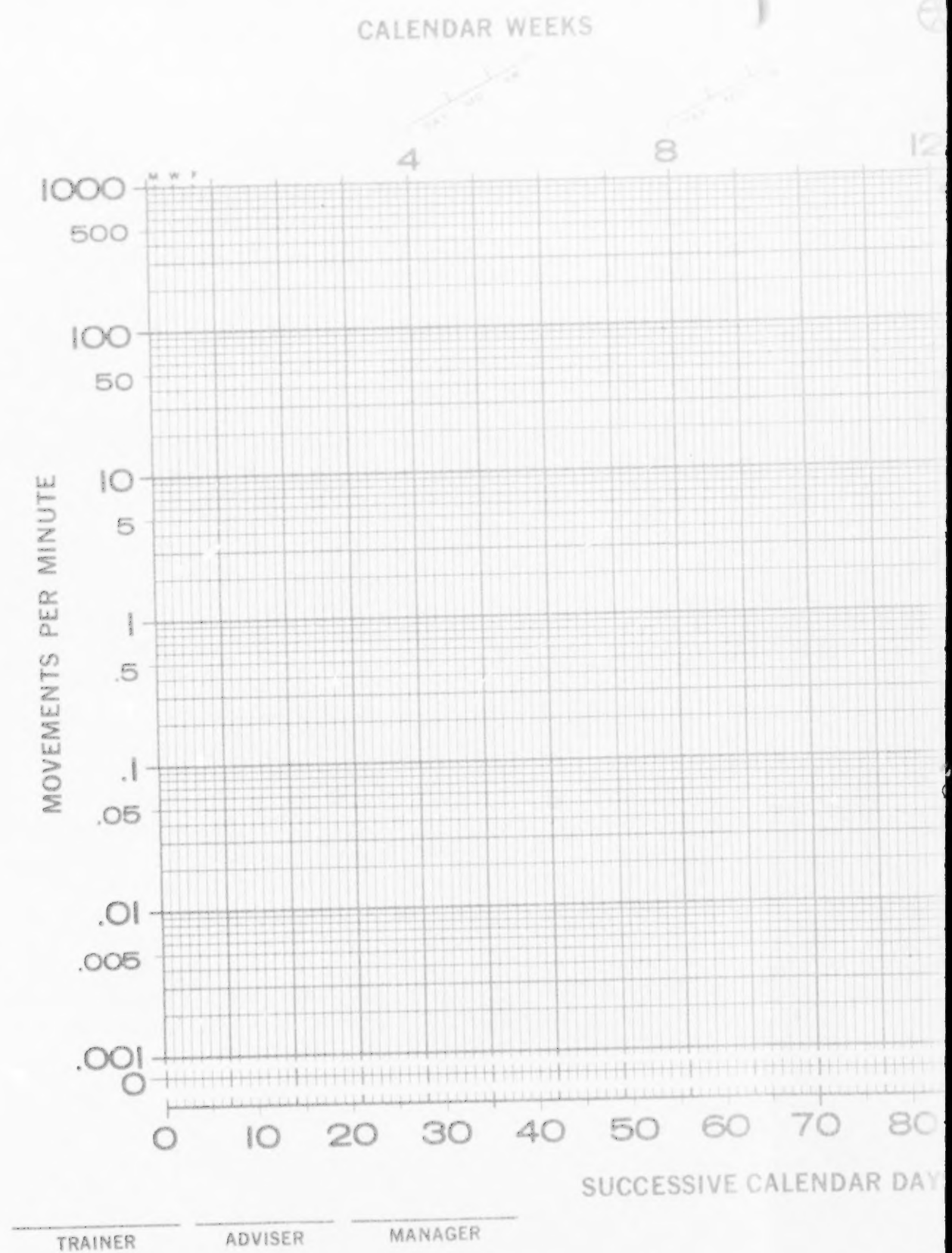


Figure 13. Six-cycle, 140-day semilogarithmic graph.

CALENDAR WEEKS



BEHAVIOR RESEARCH CO.
6 CLEVELAND ST. S.W. (4th Fl.)
BOX 9255 - KANSAS CITY, MISSOURI 64114

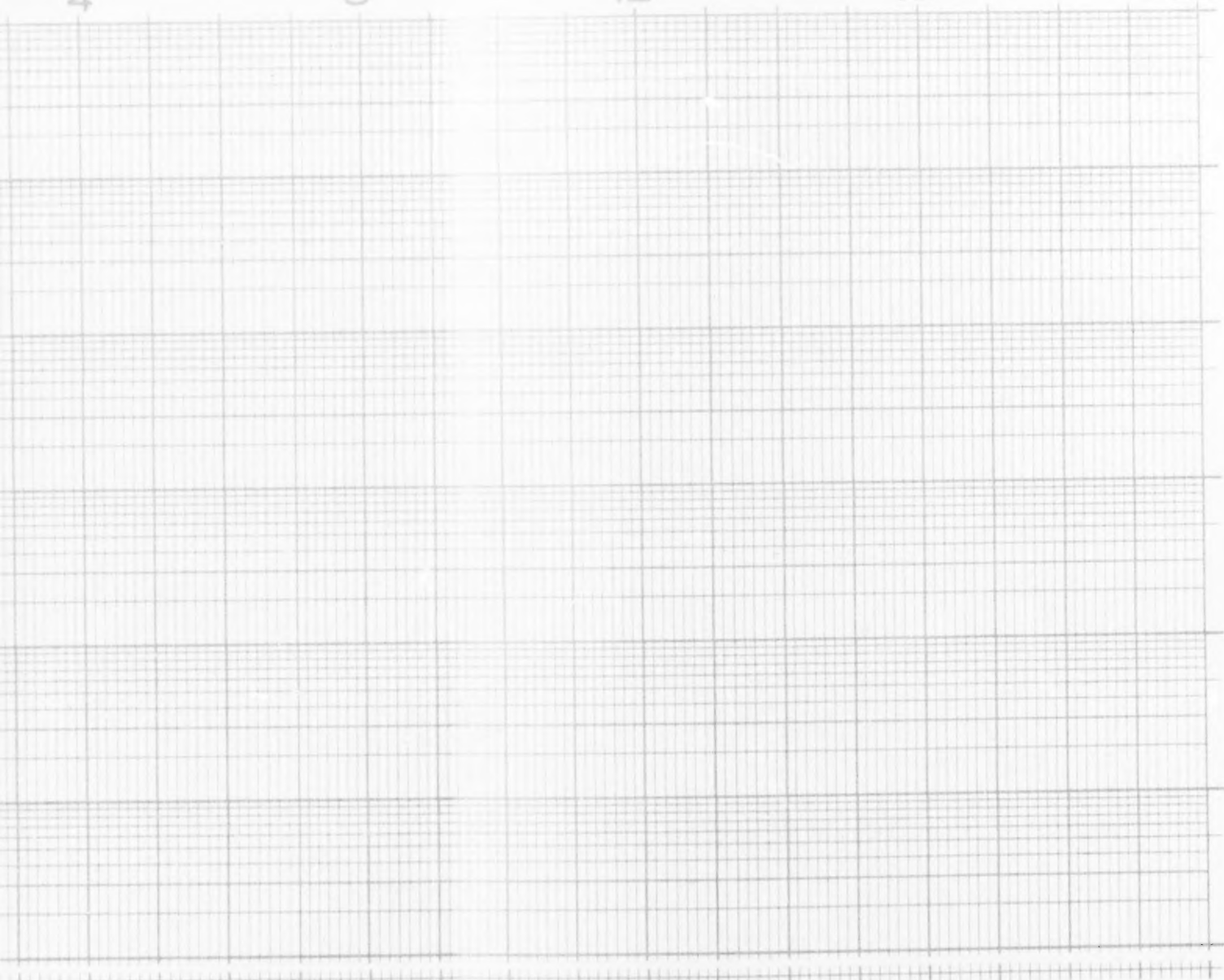
4

8

12

16

20



0 30 40 50 60 70 80 90 100 110 120 130 140

SUCCESSIVE CALENDAR DAYS

MANAGER

PROTEGE

AGE

LABEL

MOVEMENT

PROJECT
NAMES

TRAINER

ADVISER

MANAGER

PROTEGE

MOVEMENT

TARGET

A: M: D: DAILY GRAPH (DG-7)

79

thmic graph.

Appendix C

Mother's Narrative Report of Project

When I started this parent class for changing behavioral patterns of children, I had the opinion there was nothing I could do. I just had to accept things as they were. I had read in a book when my little brain-damaged daughter, Sherry, was about three years old: "A mother cannot live through her children, she must make a life of her own." This was from the book, *Jan, My Brain-Damaged Daughter*, by Camillia M. Anderson, M.D.

This attitude I immediately adopted. As a result, I still fed, clothed, bathed, loved, etc. Sherry, but at the same time I proceeded upon a path to make busy than busier my own life.

Now, years later, this leaves me with very little time to concentrate on my children, which was the number one big change I had to make if I was going to put any of the suggestions to use I learned in this class.

The main behavioral problem I had with Sherry was her constant littering about the house. There is hardly any other area I get more upset with my family about as much as for littering. Sherry being the worst.

After the first class, I went home and counted her messes and found 24.

The next day I scolded her about it, but as usual at bedtime I counted 15 littering jobs. Then I explained to her about the charts and graphs and that I was going to begin keeping a record of her messes. This made her a little less cluttery, but I'd still find 5 or 6 messes about the house when I came home from work at 5 p.m.

I then tried the Saturday box idea suggested at class, but it must have been too complicated a thought process for her because she still littered. Perhaps I didn't give it long enough or didn't take enough time with trying to explain to her.

Then we moved and everything was upset for awhile. It was hard to get Sherry not to throw things about when everything was out of place.

It was hard for her to visualize a reward that was non-existent as of yet. I then learned if I made the doll outfit AHEAD of time this reinforcement worked. I put the doll outfit where she could actually see it. I explained that at the end of a weeks period of time, it was hers if her chart had stayed at zero, with no more exceptions than possibly one.

I also found out that if I would reward her with a dime immediately for the chores she was supposed to do each day to get her allowance, that she kept her jobs done up.

My two other children could wait a week for their promised rewards. Sherry could not. Everything in her little world must be immediate. She seems not to be able to foresee into the future at all, even until afternoon or the next day.

Over the 4th of July week with running a business, preparing a float for our city's celebration, and the usual housework I failed to get a doll outfit made. Sherry's messes immediately started again.

So now at the end of the tenth week of this class another doll dress is waiting if Sherry keeps things neat.

I will have to make a change of doll clothes for something else after a while, but it has proved to me that reinforcing a child for behavioral improvement REALLY DOES WORK!